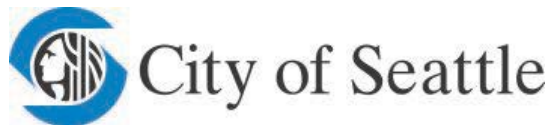


Terminal 117 Cleanup

Port of Seattle and City of Seattle

REMOVAL ACTION WORK PLAN RESIDENTIAL YARDS AREA

**LDW Superfund Site
Terminal 117 Early Action Area**



November 30, 2012

REMOVAL ACTION WORK PLAN

Residential Yards Area Lower Duwamish Waterway Superfund Site Terminal 117 Early Action Area

Submitted to
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CONTENTS

LIST OF FIGURES	v
LIST OF TABLES	vi
ACRONYMS AND ABBREVIATIONS.....	vii
1 INTRODUCTION	1-1
1.1 PROJECT BACKGROUND	1-2
1.2 REMOVAL ACTION AREA	1-2
1.3 REPORT PURPOSE AND ORGANIZATION	1-3
2 PROJECT OVERVIEW	2-1
2.1 REMOVAL ACTION OBJECTIVES.....	2-1
2.2 REMOVAL ACTION OVERVIEW.....	2-2
2.3 REGULATORY REQUIREMENTS	2-2
3 REMOVAL ACTION TEAM ORGANIZATION.....	3-1
3.1 AGENCY PERSONNEL	3-1
3.2 CONSTRUCTION MANAGEMENT / OVERSIGHT PERSONNEL.....	3-2
3.3 CONSTRUCTION CONTRACTOR.....	3-4
3.3.1 Contractor Personnel	3-4
3.3.2 Contractor Qualifications	3-7
4 CONTRACTOR WORK PLAN.....	4-1
4.1 PROJECT WORK PLAN.....	4-1
4.1.1 Methods to be Employed in the Removal Action.....	4-1
4.1.2 Equipment Types.....	4-4
4.1.3 General Schedule	4-4
4.1.4 Disposal Facilities	4-4
4.1.5 Materials Suppliers.....	4-4
4.1.6 Site Plan	4-5
4.2 CONSTRUCTION CHECKLIST.....	4-5
4.3 PROJECT SCHEDULE.....	4-5
4.4 CONSTRUCTION HEALTH AND SAFETY PLAN.....	4-5
4.5 GREEN/SUSTAINABLE REMEDIATION PLAN.....	4-6
4.5.1 Methods for Emission Reduction Controls and Policies	4-6
4.5.2 Methods for Transportation Minimization and Green Transportation.....	4-7

4.5.3	Methods of Recycling, Reuse, and Waste Minimization	4-7
4.5.4	Use of Local Materials and Facilities	4-8
4.5.5	Environmentally Sustainable Business Practices	4-8
4.6	SURVEYING PLAN	4-8
4.6.1	Independent Survey Firm	4-8
4.6.2	Survey Firm Personnel	4-9
4.7	UTILITY PROTECTION PLAN	4-9
4.7.1	Location and Identification of Utilities	4-10
4.7.2	Utility Protection	4-10
4.7.3	Notification	4-11
4.8	POLLUTION CONTROL AND MITIGATION PLAN	4-11
4.8.1	Temporary Erosion and Sediment Control Plan	4-11
4.8.2	Spill Prevention Control and Countermeasures Plan	4-13
4.8.3	Air Emissions Control	4-16
4.8.4	Noise Pollution Monitoring and Control	4-18
4.9	TRANSPORTATION AND DISPOSAL PLAN	4-19
4.10	TRAFFIC CONTROL PLAN	4-21
4.11	CLEARING, DEMOLITION, AND EXCAVATION PLAN	4-23
4.11.1	Clearing and Demolition	4-23
4.11.2	Excavation	4-24
4.11.3	Equipment Decontamination	4-26
4.12	CONTRACTOR QUALITY CONTROL PLAN	4-26
4.13	SITE RESTORATION PLAN	4-28
5	CONSTRUCTION QUALITY ASSURANCE	5-1
5.1	SUBMITTAL MANAGEMENT	5-1
5.2	PROGRESS MEETINGS	5-1
5.3	INSPECTIONS, SAMPLING, AND VERIFICATION ACTIVITIES	5-2
5.3.1	Confirmation Sampling	5-2
5.4	CONSTRUCTION QA DOCUMENTATION AND REPORTING	5-2
5.5	FIELD CHANGE DOCUMENTATION	5-4
5.6	POST CONSTRUCTION DOCUMENTATION	5-5
6	REFERENCES	6-1

APPENDICES

- Appendix A. Contractor Resumes
- Appendix B. Initial Project Schedule
- Appendix C. Site Plan
- Appendix D. Construction Checklist
- Appendix E. Contractor Health and Safety Plan
- Appendix F. Traffic Control Checklist
- Appendix G. Testing Plan and Log

LIST OF FIGURES

- Figure 1-1. T-117 Early Action Cleanup Site Overview
- Figure 1-2. Soil Excavation Boundaries for Residential Yards
- Figure 3-1. Design and Construction Management Team Organization
- Figure 4-1. Haul Route from T-117 to Highway
- Figure 5-1. Field Change Memo Form

LIST OF TABLES

Table 4-1.	Excavation Depths, Elevations, and Quantities
Table 4-2.	Emissions Control Measures
Table 4-3.	Proposed Disposal Facilities
Table 5-1.	Summary of Construction Monitoring and Testing Requirements

ACRONYMS AND ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirements
ARI	Analytical Resources, Inc.
BMP	best management practice
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CIP	community involvement plan
City	City of Seattle
COC	chemical of concern
CQAP	construction quality assurance plan
CQCP	contractor quality control plan
CY	cubic yard
DHA	Duane Hartman & Associates, Inc.
DOT	Department of Transportation
EAA	early action area
EE/CA	engineering evaluation/cost analysis
EPA	U.S. Environmental Protection Agency
HASP	health and safety plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSPA	Harris & Smith Public Affairs
Integral	Integral Consulting Inc.
LDW	Lower Duwamish Waterway
mg/kg	milligram per kilogram
NPDES	National Pollutant Discharge Elimination System
NRC	NRC Environmental Services
NTCRA	non-time critical removal action
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PCDD/PCDF	polychlorinated dibenzo- <i>p</i> -dioxin and polychlorinated dibenzofuran

Port	Port of Seattle
ppt TEQ	parts per trillion toxic equivalency
QA	quality assurance
QAPP	quality assurance project plan
QC	quality control
RADR	removal action design report
RAWP	removal action work plan
RCRA	Resource Conservation and Recovery Act
RvAL	removal action level
Settlement Agreement	Administrative Settlement Agreement and Order on Consent Number CERCLA 10-2011-0089
SOW	statement of work
T-117	Terminal 117
TSCA	Toxic Substances Control Act
USACE	U.S. Army Corp of Engineers

1 INTRODUCTION

Terminal 117 (T-117) is an early action area (EAA) within the Lower Duwamish Waterway (LDW) Superfund Site in Seattle and Tukwila, Washington (Figure 1-1). It was selected as an EAA to address polychlorinated biphenyl (PCB) contamination in sediment. In September 2010, the U.S. Environmental Protection Agency (EPA) approved an engineering evaluation/cost analysis (EE/CA; Windward et al. 2010) prepared by the Port of Seattle (Port) and City of Seattle (City). The T-117 removal action is being performed in accordance with the Administrative Settlement Agreement and Order on Consent Number CERCLA 10-2011-0089 (Settlement Agreement, including Statement of Work [SOW]; USEPA 2011) as a Non-Time Critical Removal Action (NTCRA). Preparation of a removal action work plan (RAWP) is one of the required elements under the Settlement Agreement.

The T-117 EAA includes the following subareas: Sediment Area, Upland Area, and Adjacent Streets and Residential Yards Area. The cleanup will be conducted in two coordinated phases: the Sediment and Upland Areas cleanup (Phase 1) and the Adjacent Streets and Residential Yards Area cleanup (Phase 2). The City is managing the Phase 2 cleanup, while the Port is managing the Phase 1 cleanup. Community protection measures and outreach activities related to the overall T-117 EAA cleanup are being coordinated between the Port and the City.

Phase 2 is being conducted in two steps as follows:

- The Residential Yards portion of the cleanup, which includes the cleanup of eight¹ residential yards, and portions of the roadway planting strips on South Cloverdale Street and the alleyway between South Cloverdale Street and South Donovan Street (Figure 1-2)
- The Adjacent Streets portion of the cleanup, which includes cleanup within the rights-of-ways of 16th Avenue South, 17th Avenue South, Dallas Avenue South, and South Donovan Street; and construction of new stormwater infrastructure in this area.

This RAWP summarizes the anticipated means and methods by which NRC Environmental Services (NRC) will carry out the removal action within the Residential Yards area. These means and methods are in general accordance with the construction drawings and technical specifications provided in Appendix A of the removal action design report (RADR; Integral 2012). The means and methods may be modified as necessary and appropriate to accomplish the work, provided that such methods satisfy the performance requirements set forth in the construction drawings and specifications.

¹ Portions of seven residential yards are being cleaned up to address PCB concentrations greater than 1.0 parts per million. An additional removal at the front yard of 1430 S. Donovan Street is being planned to address dioxin/furan concentrations greater than 50 parts per trillion toxic equivalency (ppt TEQ) based on an EPA directive provided in its September 5, 2012, letter.

1.1 PROJECT BACKGROUND

T-117 was selected for early action in 2003 as part of the LDW Superfund project. T-117 was specifically selected to reduce PCB contamination in sediment. PCB contamination at the site is associated with historical industrial activities that involved asphalt manufacturing in the T-117 Upland study area. Asphalt manufacturing operations included the use of recycled oils, some of which contained PCBs and were released to the surrounding environment. Asphalt manufacturing activities ceased in the early 1990s, and the former asphalt plant, tanks, and some contaminated soil were removed in 1996 and 1997. The Port acquired the former asphalt plant property in 2000. Currently, the T-117 Upland study area is fenced, secured, and vacant.

Numerous independent and joint investigations with EPA have been conducted by the City within the Streets and Yards study areas from 2004 to present. These studies have focused on characterizing the nature and extent of contamination, and confirming the removal action boundaries. These investigations focused primarily on the designated chemicals of concern (COCs) for the Streets and Yards: PCBs, and dioxins and furans (where co-located with PCBs that exceed the action level). In 2004 and 2005, the City completed a series of interim actions in portions of the Streets and Yards study areas. Descriptions of these past investigations and interim actions are summarized in the EE/CA (Windward et al. 2010).

In 2012, the City conducted an extensive sampling program to support the removal action design and to confirm the areal and vertical extent of removal for the Streets and Yards study area. The results of this investigation are presented in Appendix G of the RADR (Integral 2012).

1.2 REMOVAL ACTION AREA

The Residential Yards Cleanup area comprises seven residential properties bounded by Dallas Avenue S., S. Donovan Street, 14th Avenue S., and 16th Avenue S.; an alleyway between S. Cloverdale and S. Donovan; and planting strips along S. Cloverdale Street (Figure 1-2).

A marina and boatyard are located immediately north of the Yards study area, adjacent to the LDW, and the Upland study area is to the east. The South Park business district is located to the west of the Yards study area along 14th Avenue S. The land within the study area is zoned as either commercial or neighborhood commercial; however, it is predominantly used as single-family residential. While some lots do have private driveways, most are accessed either via parallel parking along street frontages or through alleyways. The distribution and magnitude of COCs within the Residential Yards study area are discussed in the RADR (Integral 2012).

1.3 REPORT PURPOSE AND ORGANIZATION

The primary purpose of this RAWP is to document NRC's proposed means and methods for executing the work, as set forth in the RADR (Integral 2012). The RAWP provides detailed procedures, methods, and layouts for accomplishment of the work. The RAWP also summarizes the contractor's construction quality control (QC) program and related elements of the City's construction quality assurance (QA) program.

The RAWP is intended to demonstrate that the proposed means and methods for executing the work are appropriate and sufficient to achieve the project cleanup goals, are protective of worker health and safety, the public, and the environment, and are consistent with construction drawings and technical specifications in appendix A of the RADR (Integral 2012). The RAWP supplements the construction drawings and technical specifications during execution of the work; all work will be conducted in accordance with the construction drawings and technical specifications and the RAWP, as approved by EPA. The construction drawings and specifications shall be the prevailing documents in the event of a discrepancy between the design details and procedural requirements set forth in the RAWP.

This RAWP is organized as follows:

Section 1—Introduction. Introduction and overview of RAWP organization and relevant project background.

Section 2—Project Overview. Overview of the removal action objectives and planned removal activities as well as the applicable regulatory requirements.

Section 3—Removal Action Team Organization. Introduction of EPA, City, and NRC team members and their roles; description of NRC and subcontractor qualifications.

Section 4—Contractor Work Plan. Brief descriptions of NRC's proposed means and methods for carrying out the work including NRC's work plans for key elements of the work (e.g., utility protection, surveying, waste transport and disposal, site restoration, etc.) and other work considerations (e.g., project schedule, green remediation, sustainable practices).

Section 5—Construction Quality Assurance. Overview of City's construction QA program, including construction documentation and reporting activities and procedures for coordinating with EPA regarding compliance with EPA's Offsite Rule.

Section 6—References.

Appendices. Included as appendices are copies of NRC-provided attachments identified in Section 4, such as the construction checklist, project schedule, and construction health and safety plan (HASP).

2 PROJECT OVERVIEW

As discussed in Section 1.1, prior investigations have produced extensive data that have been used to characterize the nature and extent of contaminated soils in the Residential Yards study area. Contaminated soils requiring removal have been identified in portions of seven residential properties, portions of planting strips within the S. Cloverdale Street right-of-way, and the alleyway between S. Cloverdale Street and S. Donovan Street. The locations of these affected properties are shown on Figure 1-2.

2.1 REMOVAL ACTION OBJECTIVES

The primary objective of the Residential Yards cleanup is to reduce risks to human health and the environment.

Total PCB concentrations determine the extent of the excavation prisms in the Residential Yards study area. As outlined in Section 4.4.3 of the EE/CA (Windward et al. 2010), cleanup in the Residential Yards study area is guided by the following decision rules:

- Total PCB concentrations are the driver for this Residential Yards cleanup.
- Cleanup will occur where total PCB concentrations exceed the removal action level (RvAL) of 1 mg/kg. For yard decision units characterized by multi-increment sampling, a remediation level of 0.5 mg/kg total PCBs is used to define portions of the yards to be removed. The 0.5 mg/kg total PCB remediation level was developed from an evaluation of variability in triplicate multi-increment samples collected from decision units as discussed in Appendix L of the EE/CA (Windward et al. 2010). Alleyway sampling followed procedures similar to those used to establish decision units but have lower ratio in composite sample collection. EPA has determined the variability analysis completed in the EE/CA for yard decision units applies to the alleyway areas and the remediation level for total PCBs will be 0.5 mg/kg. Planting strips are of limited area and were sampled using a different approach. Remedial action will be completed where all point samples in a given planting strip area, at a given depth, are less than the RvAL for total PCBs of 1 mg/kg.

Wherever PCB cleanup occurs, co-located polychlorinated dibenzo-*p*-dioxins and polychlorinated dibenzofurans (PCDD/PCDFs) will also be removed.

2.2 REMOVAL ACTION OVERVIEW

The primary removal activities for the affected properties will include removal of hardscape features such as private sidewalks, patios, and garden sheds; stripping of existing vegetation for offsite transport and disposal; excavation of contaminated soils to pre-determined depths for offsite transport and disposal; backfilling with clean import materials to original grades; and site restoration.

Most plants and grasses will be removed from affected properties, while large trees and shrubs will generally be left in place. In general, target excavation depths have been determined and range from 6 to 36 inches; however, shallower excavations will be performed within the root zones of trees and shrubs that will remain in order to ensure the vegetation will not be damaged. Pre-removal sampling was not feasible in the planting strips on the south side of S. Cloverdale Street and confirmation sampling will be completed during removal as outlined in the quality assurance project plan (QAPP; Appendix G to the RADR; Integral 2012) to determine the final depth of excavation.

Following backfilling of the excavations, the residential yards and planting strips will be restored by replanting or replacing any removed plants and grasses and reconstructing hardscape features. The alleyway will be reconstructed with compacted gravel to finished grade. Details regarding the construction site layout, equipment use, construction procedures, and construction schedule are presented in Section 4 of this RAWP.

2.3 REGULATORY REQUIREMENTS

Federal and state regulatory requirements and guidance that were followed in the design of removal activities are describe in detail in the EE/CA (Windward et al. 2010). Section 121(e) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 USC § 9621(d), and the National Contingency Plan at 40 CFR § 300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites attain applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations, which are collectively referred to as ARARs, unless such ARARs are waived under CERCLA Section 121(d)(4). A comprehensive list of ARARs is provided in Attachment C to the action memorandum for this NTCRA (USEPA 2010). In addition, a list of regulations and guidance that apply to the remedial design and remedial action process for this NTCRA is included in Appendix A (SOW) of the Settlement Agreement (USEPA 2011). The listed ARARs that are potentially applicable to the Residential Yards cleanup include:

Worker Safety

- Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER, 29 CFR 1910.120)

- Washington Industrial Safety and Health Act (WAC 296-155).

Waste Disposal

- Resource Conservation and Recovery Act (RCRA, 40 CFR 260)
- Toxic Substances Control Act (TSCA, 40 CFR 761)
- Washington Solid Waste Handling (WAC 173-350 and -351)
- Washington Hazardous Waste Management Act (Chapter 70.105 RCW)
- Washington Dangerous Waste Regulations (WAC 173-303).

Water Pollution Control

- Clean Water Act and National Pollutant Discharge Elimination System (NPDES, 40 CFR 100-149)
- Washington Water Pollution Control Act (Chapter 90.48 RCW)
- Washington NPDES Program (WAC 173-216 and -220).

Noise Limitations

- Washington Noise Control Act of 1974 (WAC 173-60).

Other Potential Criteria

- Endangered Species Act
- U.S. Fish and Wildlife Coordination Act
- Migratory Bird Treaty Act
- National Historic Preservation Act
- Native American Graves Protection and Repatriation Act
- Washington State Environmental Policy Act.

Details concerning how construction activities will be performed in compliance with applicable requirements are contained in the work plans presented in Section 4 of this RAWP.

3 REMOVAL ACTION TEAM ORGANIZATION

The City and Port are responsible for the T-117 NTCRA. The Port is the lead entity for the Upland and Sediment study areas (Phase 1) of the T-117 cleanup while the City is the lead entity for the Streets and Yards study areas (Phase 2). EPA has lead responsibility for regulatory oversight. This RAWP addresses the Residential Yards cleanup portion of the Phase 2 cleanup. The City will be responsible for implementing and overseeing the Residential Yards cleanup and, as such, executing the construction contract. The roles, responsibilities, and lines of communication for these and other key members of the project team are described in the following sections and illustrated in the organization chart presented in Figure 3-1.

3.1 AGENCY PERSONNEL

EPA is the regulatory authority and responsible agency for authorizing and overseeing the removal action. In this capacity, EPA has reviewed and maintains approval authority over the construction drawings and technical specifications presented in Appendix A of the RADR (Integral 2012). Contractor submittals included in this RAWP will be reviewed by EPA to ensure that the City's construction QA and NRC's construction QC programs are consistent with the removal design objectives. Even though EPA approvals of design documents and RAWP are required, the burden of meeting the performance standards specified in the Settlement Agreement (USEPA 2011) is the responsibility of the performing party. Both EPA and its oversight contractor have the authority to direct the City to stop work. The following EPA staff will have key roles in this project.

Remedial Project Manager

EPA's remedial project manager is Piper Peterson. The remedial project manager is responsible for overseeing the removal action to ensure that when the remedy is performed, it is protective of human health and the environment, and that the work meets removal action objectives and is implemented in accordance with the Settlement Agreement (USEPA 2011).

Agency Construction Oversight Manager

Under an agreement between the U.S. Army Corp of Engineers (USACE) and EPA, Jayson Osborne (with USACE) will be the agency construction oversight manager who will exercise project oversight for EPA and coordinate with the City. The agency construction oversight manager is responsible for ensuring that the construction activities comply with the Settlement Agreement (USEPA 2011), construction drawings and technical specifications in Appendix A of the RADR (Integral 2012), and the final approved RAWP.

3.2 CONSTRUCTION MANAGEMENT / OVERSIGHT PERSONNEL

The City is the lead entity responsible for the overall planning and implementation of the Residential Yards cleanup activities to ensure the cleanup performance standards are met. As the lead design consultant to the City, Integral Consulting Inc. (Integral) was responsible for developing the Residential Yards RADR (Integral 2012), including construction drawings, technical specifications, and related plans, and will be responsible for implementing the construction quality assurance plan (CQAP) included in Appendix B of the RADR and for preparing the removal action completion report.

Project Coordinator

The City's project coordinator (Mary Mitchener, Hart Crowser, Inc.) is responsible for coordinating the remediation activities, and ensuring that all work is conducted in accordance with the EPA-approved design and RAWP. The City's project coordinator oversees program activities and performs management oversight and agency coordination. The City's project coordinator approves required project design and construction deliverables, major contractor submittals, design revisions, and attends internal team meetings, weekly construction quality assurance meetings, and external meetings with EPA. The City's project coordinator is the main point of contact with EPA for final approval of necessary actions and adjustments of activities to accomplish project objectives.

The City's project coordinator is also responsible for internal City coordination of contracting and construction management. The City's project coordinator manages all scheduling and coordination of City resources as needed to ensure contractor procurement and execution of the contract.

Consultant Project Manager

The City's consultant project manager (Linda Baker, R.G., L.H.G., Integral) has overall responsibility for the execution of consultant work. The consultant project manager will manage the contract, schedule, budget, and project deliverables for removal action oversight services provided by Integral and reports to the City's project coordinator.

Resident Engineer

The City's resident engineer (Eric Pilcher, P.E., Integral) is responsible for technical aspects of construction management. The City's resident engineer reports to the City's project coordinator and Consultant project manager. The City's resident engineer monitors NRC's compliance with the contract, detects variances between the contract as written and the desired work to be performed, notifies the City's project coordinator of any variances, and obtains approval from the City's project coordinator (including funding adjustments) to execute change orders to modify the desired work within the contract.

The City's resident engineer has authority to direct NRC to modify or cease operations when out of compliance with contract requirements. The City's resident engineer obtains approval from the City's project coordinator when Contractor operations are in compliance with contract requirements but require modification to meet project objectives.

The City's resident engineer is also responsible for administering the community HASP and coordinating construction access issues with property owners and tenants during the construction. The City's resident engineer reports access conflicts to the City's project coordinator for resolution.

The City's resident engineer is the primary means of contact with NRC and is the only individual to direct NRC or modify NRC activities on the City's behalf. All quality assurance-related concerns and communications are routed through and processed by the City's resident engineer.

Quality Assurance Representative

The City's QA representative (Zach Estela, Integral) will be responsible for performing QA activities as described in the CQAP and advising the project team in responding to construction-related engineering and design needs (e.g., unforeseen conditions, proposed field changes to the design). The City's QA representative will report directly to the City's resident engineer and will coordinate with other Integral project personnel and subconsultants assigned to the construction project.

The City's QA representative will advise the resident engineer on matters affecting project QA/QC and will have an onsite presence during all critical construction activities, including excavation, backfill, inspections of backfill materials for acceptance, and interpretation of pre- or post-excavation surveys and post-backfill surveys. The City's QA representative will regularly interact and communicate with NRC, as necessary, to verify NRC's compliance with construction QA/QC requirements.

Site Health and Safety Officer

Each company or organization working on the site will be responsible for developing and implementing its own site health and safety program.

Integral's site health and safety officer (Eric Pilcher, P.E., Integral) will be responsible for overseeing the health and safety program for the City's project management and QA team and will administer the QA HASP. The site health and safety officer will also be responsible for verifying that NRC performs its work activities in accordance with the site-specific construction HASP and for ensuring that the community HASP is effectively implemented and that the removal action construction team is fully aware of the associated requirements.

Other Key Quality Assurance Team Members

Landscape Architecture—J.A. Brennan, Associates PLLC, was responsible for developing landscaping plans for the restoration of the yard and is responsible for verification of the quality of NRC's restoration activities. A representative of J.A. Brennan will be present during coordination meetings with homeowners and tenants to discuss site features that are to be preserved and coordinate restoration features. J.A. Brennan will be a technical resource during construction to address landscaping related questions and during site restoration will assist the City's resident engineer in confirming acceptable compliance with the restoration plans.

Community Involvement—Harris & Smith Public Affairs (HSPA) is responsible for community outreach and communication as described in the community involvement plan (CIP; HSPA and Integral 2012). The CIP sets the framework for notifying and interacting with residents and businesses that will be impacted by the removal action, as well as other stakeholders and the public as a whole.

3.3 CONSTRUCTION CONTRACTOR

NRC will perform the removal activities, including clearing, excavation, transport, and disposal of contaminated soils, placement of backfill, and restoration of landscaping, track and document green remediation practices, and support outreach activities to the community. NRC will implement site controls to restrict unauthorized access, manage traffic, and minimize environmental impacts, and will also monitor health and safety activities for site workers, subcontractors, and community members.

These activities will be conducted in accordance with the construction drawings and technical specifications presented in Appendix A of the RADR (Integral 2012) and NRC's work plans presented in Section 4 of this RAWP.

3.3.1 Contractor Personnel

NRC was selected from a list of contractors pre-qualified by the City to perform environmental remediation construction.

NRC's personnel and functions, as well as any subcontractors under the direction of NRC, are described below. The following sections delineate roles and responsibilities for key members of NRC's team.

Contractor Project Manager

The contractor project manager (Russell Morgan, NRC) reports directly to the City's resident engineer and will regularly interact and communicate with the City's QA representative. NRC's project manager provides management of and direction to all contractor and

subcontractor personnel and has overall responsibility for executing the work in compliance with the EPA-approved construction drawings and technical specifications presented in Appendix A of the RADR (Integral 2012) and this RAWP.

Contractor Quality Control Representative

The contractor QC representative (Scott St. John, NRC) is responsible for implementing the contractor quality control plan (CQCP) presented in Section 4.12 of this RAWP. NRC's QC representative reports to NRC's project manager and is responsible for, but not limited to:

- Providing and maintaining an effective quality control system for all construction tasks
- Coordinating quality control monitoring activities and preparing construction submittals
- Monitoring quality control activities to ensure conformance with authorized policies, procedures, contractor work plans (e.g., pollution prevention and mitigation plan, transport and disposal plan) and sound construction practices, as well as recommending improvements, as necessary
- Conducting the weekly quality control meeting and submitting the meeting minutes electronically to the City's resident engineer and QA representative and the agency construction oversight manager
- Conducting other meetings with the construction team covering the requirements of the QC procedures presented in the CQCP (Section 4.12 of this RAWP) and, as appropriate, the CQAP
- Informing, identifying, and resolving nonconformance issues
- Preparing and submitting electronically the daily construction QC reports to the City's resident engineer and QA representative
- Responding to nonconforming work and associated communication and documentation requirements
- Preparing and tracking field change requests when required to obtain design engineering approval of requested field changes
- Maintaining record drawings and construction red-line drawings
- Taking progress photographs and preparing and submitting weekly progress reports to the City's resident engineer and QA representative.

Contractor Project Supervisor

The contractor project supervisor (Scot Overdick, NRC) provides day-to-day onsite management and direction to the construction contractor personnel. NRC's project supervisor reports to NRC's project manager and is responsible for executing the work in full compliance

with the design drawings and specifications presented in the RADR (Integral 2012). In addition, the project supervisor will verify proper operation and maintenance of equipment, manage subcontractors, and provide daily reports to the City's resident engineer. NRC's project supervisor is responsible for:

- Coordinating with off-site staff
- Managing and coordinating all removal action subcontractors on the site
- Ensuring completion of the construction in accordance with the contract documents, applicable codes and standards, and the approved RAWP
- Ensuring completion of the project on schedule and within budget
- Ensuring that appropriate change management procedures are in place to reliably track requested scope of work changes, evaluate their effects, and if approved, implement and document the changes
- Ensuring that adequate site security, appropriate for the activities being performed, is maintained
- Ensuring that construction equipment is properly serviced and used
- Ensuring that an adequate labor force is assigned to the project with the proper training, education, experience, skills, tools, equipment, and materials to complete the construction and minimize potential impacts to the environment
- Revising activities in response to observations, accidents, emergencies, or community complaints.

Contractor Safety Officer

The contractor safety officer (Scot Overdick, NRC) ensures that operations are performed in accordance with the site-specific construction HASP and the community HASP. NRC's safety officer is responsible for the following:

- Supervising the health and safety of construction personnel relative to compliance with all applicable regulations
- Ensuring that construction team members understand the requirements of the site-specific construction HASP and the community HASP for work on the site
- Conducting and documenting daily health and safety briefings
- Exercising stop work authority when warranted by conditions
- Ensuring that site personnel have received required training and maintaining documentation of such training on the project site
- Supporting the project supervisor in response to accidents, complaints, and incidences

- Functioning as a technical resource for all environmental, safety, loss, industrial, and hygiene issues.

Other Contractor Personnel

Other site personnel may be added as deemed necessary by NRC. Additional responsibilities of NRC's project manager and project supervisor and responsibilities of other site personnel are determined by NRC.

3.3.2 Contractor Qualifications

Russell Morgan, Contractor Project Manager

Mr. Russell Morgan has more than 30 years of experience in the construction, environmental, and remedial industries. His expertise includes project management, project oversight, engineering, project estimation, scheduling, quality control, cost control/tracking, and remediation implementation. As a senior project manager, Mr. Morgan has an extensive background in technical support and construction management for various engineering activities, including remediation projects, surface and subsurface excavations. His experience in heavy civil construction and the environmental industry includes expertise in gas extraction and treatment, landfill design and construction, waste water treatment, quality assurance and quality control, project scheduling and cost/ labor analysis, material stabilization, and heavy media separation.

Scott St. John, Contractor Quality Control Representative

Mr. Scott St. John is an environmental manager with 18 years of experience managing multidisciplinary environmental cleanup projects for private enterprise, and on county, state, and federal contracts. Mr. St. John is an innovative and energetic leader, skilled communicator and team builder. He is knowledgeable and skilled in working under environmental laws/regulations (RCRA, TSCA, CERCLA, NRC, Department of Transportation [DOT], OSHA, 40-CFR and state) and has a proven track record of timely and satisfactory completion of environmental remediation and emergency response projects.

Scot Overdick, Contractor Project Supervisor and Safety Officer

Mr. Scot Overdick is a senior project manager with NRC's Seattle office. He manages and performs excavation and remediation services for NRC customers. These projects primarily include cleanups related to hazardous materials incident emergency responses, underground storage tank removals, contaminated soil removal, and remediation system services. Remediation system services include design support, construction, startup, operation, maintenance and decommissioning of soil and groundwater remediation equipment systems.

Mr. Overdick is an experienced safety officer. He has more than 20 years of experience in safety, industrial hygiene, public health, radiation protection, environmental protection and loss

control management in emergency response, hazardous waste remediation, solid waste treatment, construction and manufacturing.

Resumes for Russell Morgan, Scott St. John, Ken Koppler, and Scot Overdick are included in Appendix A.

3.3.2.1 Subcontractors

Duane Hartman & Associates, Inc., Independent Surveyor Firm

Duane Hartman & Associates, Inc. (DHA), a Veteran-Owned Small Business, delivers land surveying and mapping services to private and public clientele throughout Washington State and the Pacific Northwest. Owned and managed (since 1993) by Duane Hartman, a local professional surveyor, the firm practices pride in excellence and cost efficient services for clients throughout the greater King, Pierce, and Snohomish County regions. DHA has an excellent reputation for being a team player with government and private clientele in need of surveying and mapping services.

Analytical Resources Incorporated, Analytical Laboratory

Analytical Resources, Inc. (ARI), a Washington corporation, was founded in March 1985 by four principals combining 60 years of experience in environmental chemistry. The firm has grown to a total staff of 45 people, including 40 scientists with bachelor's degrees or higher. ARI currently provides analytical services for regional, national, and international clients. ARI holds long-term contracts to provide dioxin/furan analyses for the EPA Contract Laboratory Program, USACE, the Navy, the Boeing Company, and many other private and public organizations. Laboratory operations are organized into three main divisions: Organics, Inorganic, and Geotechnical. ARI's Quality Assurance, Client Services, and Computer Services divisions provide administrative support for ARI's comprehensive team effort. ARI is an accredited laboratory in the State of Washington per WAC 173-50 and is accredited under the U.S. Department of Defense Environmental Laboratory Accreditation Program.

Teufel Landscaping, Landscaping Subcontractor

Teufel Landscaping will assist NRC with landscaping tasks associated with the project and will provide specified plants. Teufel Nursery was founded in 1890 by Gustav Teufel, a landscape gardener who believed that quality grown plants and thoughtful design were essential to all landscape projects. Four generations later Teufel Nursery is still family owned and operated. As a grower of premium nursery stock and a major provider of landscape services throughout the Northwest, Teufel has earned a reputation as leader in the green industry.

Robinson Noble, Geotechnical/Soil Testing Subcontractor

Robinson Noble provides geotechnical engineering solutions and construction testing services. Robinson Noble geotechnical engineers have engaged in nearly every facet of geotechnical engineering and soil mechanics, with direct experience in soil mechanics, geotechnical

feasibility and design, geologic hazard evaluation, field inspection, and soil testing. Robinson Noble maintains an in-house laboratory equipped to evaluate the properties and characteristics of soil, completed in accordance with the standards of the American Society for Testing and Materials.

4 CONTRACTOR WORK PLAN

4.1 PROJECT WORK PLAN

The intent of this project work plan is to present the general sequence of pre-construction and construction/remediation activities planned to take place at the T-117 Yard removal action site. In addition, this plan summarizes the proposed methodology for performing various phases of the work. It describes possible equipment and personnel to be used, general sequencing of the work activities, the use of the site for staging, stockpiling and other activities, and security. This project work plan has been prepared in coordination with Section 01 40 00 of the technical specifications, the community and contractor HASPs, and the T-117 RADR. Use of the Port property as a staging area is discussed in the Port property access agreement included in Appendix H.

The primary removal activities for the affected properties will include excavation of contaminated soils to pre-determined depths/elevations and backfilling with clean import materials to original grades. Most plants and grasses will be removed from affected properties, while large trees and shrubs will generally be left in place. Following backfilling of the excavations, the affected yards and parking strips will be restored including replacement of any removed plants and grasses. Alleyways will be restored with gravel. Table 4-1 summarizes the excavation design details for each of the affected properties including area, depth, volume, and target elevation for each excavation.

4.1.1 Methods to be Employed in the Removal Action

At each property, a series of eight tasks will be implemented to achieve excavation objectives. These tasks will incorporate communication and approval protocols with the property owner, environmental protection site controls, excavation and removal procedures, and site restoration. The eight tasks are as follows:

Task 1—Notify property owner. Prior to the beginning of onsite construction, the City will contact the property owner to confirm the extent of planned removal and restoration activities and to schedule its implementation. To the extent practical, an onsite “walk through” will be conducted with each owner and representatives of the City, EPA, and NRC to confirm details of the planned removal activities.

Task 2—Set up site controls. At the start of the scheduled removal, NRC will establish barriers using temporary fencing, yellow precaution tape, stanchions, temporary construction fencing and/or silt fencing to demarcate exclusion zones, contaminate reduction zones, and safe zones where active construction activities are to take place. Site pollution control facilities such as

wheel cleaning stations and stormwater control best management practices (BMPs) will also be provided as applicable.

NRC will provide appropriate housekeeping and site management throughout all subsequent phases of construction. This includes maintaining exclusion zones, contaminate reduction zones, and safe zones; maintaining emergency equipment on site (e.g., first aid kit, eye wash, fire extinguisher, spill containment kit, spare personal protective equipment); performing daily inspections of the work area; repairing or replacing demarcation tape, silt fence, erosion control products, and visqueen tarps within exclusion zones; and providing traffic control when construction trucks and equipment are present.

Task 3—Remove surface vegetation and obstructions. After site controls have been established, all surface obstructions that are not intended to be disturbed will be marked and properly protected while those features scheduled for removal will either be stored for later restoration or disposed of offsite at an appropriate facility.

Task 4—Excavate, transport, and dispose contaminated soil. The designated areas of contaminated soil will be excavated, loaded into haul trucks, or bins and transported to the approved landfill for disposal.

NRC will excavate most yards utilizing a mini excavator, skid steer loaders, vacuum truck, and air knife. The combination of these major pieces of equipment will be utilized as appropriate for individual properties. Yards will generally be divided into two sections the left and right side of the house with the front and back sidewalks as a dividing line. Excavation activities will begin at the point furthest from the bin on one side of a house. The excavator will sit on the contaminated soil excavating and pulling material to the machine. The soil will be placed in the skid steer loaders which will be used to transport the soil via the designated haul route to the bin. Once the area within the excavators reach has been excavated, the mini excavator will utilize its smooth edge bucket or a grade beam to perform a final scrape of the excavated area. This scraping will remove any sloughed soils.

Excavations will continue along the leading edge of the contaminated area proceeding from the back of the property to the front. Excavation equipment operators will perform work from on top of the contaminated soil to the extent possible. In areas where equipment must cross or work from a clean area the clean area will be covered with plastic sheeting and/or plywood in the areas where equipment must travel or sit to operate.

When NRC has completed removal activities at a given residential yard the excavating equipment (e.g., mini-excavator, skid steer loaders, etc.) will be decontaminated prior to relocation to the next property. Decontamination will typically be performed utilizing dry decontamination methods as discussed in Section 4.11.3 of this RAWP. However, if the dry decontamination method is not sufficient to remove the gross contaminants from a piece of

equipment one of two wet decontamination methods will be utilized to further decontaminate the equipment. The first is the wet decontamination of the equipment utilizing wet rags to wipe soil from the equipment. Contaminated rags generated during this decontamination process will be disposed of with the contaminated soil.

If it is determined that additional decontamination is required, NRC will utilize a wet scrubbing technique. NRC will start by erecting a temporary plastic containment cell (cell) with 5 to 12-inch sides to collect any excess wash water generated during the wet scrubbing at the lower or sump side of the cell. One side of the cell will be lowered to ground level to allow the equipment to enter the cell. Once inside the cell the side will be raised forming a complete containment around the base of the equipment. Workers inside the cell will use water soaked rags and brushes to scrub soil from the equipment. Scrubbing of the equipment will include all areas visually contaminated with soil or that were in contact with soils (e.g., tracks, wheels, bucket, etc.) Additional clean wet rags and water will be used to wipe down or flush the equipment following scrubbing. Wash water and rinsate generated during the decontamination process will be vacuumed with a vacuum truck and transported offsite for disposal. Rags will be placed in soil bins for offsite disposal.

Once the equipment is visually inspected by the QC Officer or his representative and approved as decontaminated, the opposite side of the containment will be lowered and the equipment will be driven onto an equipment trailer for transport to the next yard or tracked/driven to the next yard if it is adjacent to or in proximity to the original property.

Task 5—Import and emplace backfill materials. Clean replacement backfill materials will be imported and placed in the excavated areas to restore site topography to pre-excavation elevations. Excavations will generally be backfilled within 24 to 48 hours of removal activities.

Task 6—Restore vegetation and previously removed objects. Plants and grasses previously cleared from the excavated areas and stored for reinstallation will be restored in accordance with the restoration plan established for each property. Any stored items previously removed from the property during Task 3 will be restored to their original locations. Demolished features that could not be saved for reuse will be replaced.

Task 7—Demobilize contractor equipment and remove site controls. After all active site construction activities have been completed, NRC will remove the access restriction barriers and demobilize all construction equipment. Some erosion and sediment controls may remain until new grass is fully established.

Task 8—Maintain property restoration and obtain owner approval. After completion of the property restoration, the City will contact the property owner to schedule a walk-through inspection. The inspection will be conducted with each owner, and representatives of the City, the EPA, and NRC to confirm satisfactory completion of the construction activities. Items

remaining to be completed or corrected will be documented on a pre-final punch list for NRC to address. NRC will provide a maintenance plan for landscape plantings to the property owner. NRC will perform continued maintenance activities to maintain temporary stormwater pollution controls, water and fertilize new vegetation, and repair any significant erosion of the replaced soil until all items on the pre-final restoration punch list are addressed and City and EPA acceptance is obtained. NRC will provide up to two follow-up landscape maintenance visits as described on the construction drawings, one in early May and one in late July, if requested by the property owner.

4.1.2 Equipment Types

Equipment that will be used to achieve the project objectives includes but is not limited to the following:

- Mini-excavator
- Skid-steer loader
- Vactor trucks (air movers)
- 20–30 cubic yard (CY) roll-off boxes
- Roll-off box transfer trucks
- Dump trucks
- Hand tools (shovels, trowels, picks, rock bars, etc.).

4.1.3 General Schedule

A project schedule has been prepared and submitted in this RAWP as Appendix B.

4.1.4 Disposal Facilities

Disposal facilities to be used for contaminated soil on this project include the Waste Management Columbia Ridge Landfill (RCRA Subtitle D Landfill) in Arlington, Oregon. The Waste Management Alaska Street Transfer Facility in South Seattle will be used as an intermediate facility for rail transfer. Demolition debris may be recycled at the Republic Services Recycling and Transfer Station in Seattle, Washington. A more detailed discussion of transportation and disposal operations is included in Section 4.9 of this document (Transportation and Disposal Plan).

4.1.5 Materials Suppliers

Backfill and aggregate for the project will be provided by one or more potential suppliers. Proposed suppliers and locations are:

Lloyd Enterprises, Inc.
34667 Pacific Highway S
Federal Way, WA 98003
(253) 874-6692

Pacific Topsoil
6000 South 129th Street
Tukwila, WA 98178
(206) 772-3091

Miles Sand & Gravel
400 Valley Avenue NE
Puyallup, WA 98372
(253) 833-3705

Washington Rock Quarries Inc.
29104 Camp One Rd E
Orting, WA 98360
(360) 893-5500

4.1.6 Site Plan

A site plan is included as Appendix C and includes locations of all temporary facilities and staging and access areas, work areas, onsite equipment and material storage areas, temporary facilities, loading areas, access and haul routes, site trailers, trash dumpsters, and temporary sanitary facilities.

4.2 CONSTRUCTION CHECKLIST

A construction checklist has been developed that is based on requirements of the contract documents and includes items that will be in place and operational prior to the start of any groundbreaking activities. The Construction Checklist is included as Appendix D.

4.3 PROJECT SCHEDULE

A project schedule has been prepared in accordance with Technical Specifications Section 01 32 10 – Construction Progress Documentation and is included as Appendix B. The schedule will be periodically updated as required in Technical Specifications Section 01 32 10 – Construction Progress Documentation.

As indicated in the project schedule, excavation and restoration of specific properties is sequenced to prevent cross-contamination of clean or restored areas. Planting strips will not be excavated until after the yards abutting them have been completed. Similarly, the backyards abutting the alleyway will be excavated prior to excavation within the alleyway.

4.4 CONSTRUCTION HEALTH AND SAFETY PLAN

A site-specific construction HASP has been prepared in accordance with Technical Specifications Section 01 35 30 – Safety and Health Requirements for Hazardous Waste Operations. The Construction HASP describes the health and safety requirements for the job

site activities, and the measures and procedures to be employed for protection of on-site personnel. The construction HASP is included as Appendix E. Emergency contact information is as follows:

Role/Facility	Name	Telephone Number
Remedial Project Manager	Piper Peterson, EPA	(206) 719-0740
Agency Construction Oversight Manager	Jayson Osborne, USACE	(206) 369-2615
City Project Manager	Mary Mitchener, Hart Crowser	(206) 369-3132
City Resident Engineer	Eric Pilcher, Integral	(253) 370-5894
NRC Project Manager	Russell Morgan	(503) 849-0753
NRC Project Supervisor	Scot Overdick	(425) 417-5344
NRC Safety Officer	Scot Overdick	(425) 417-5344
NRC Safety Manager	Ken Koppler, CIH	(971) 285-0450
Hospital	Highline Medical Center	(206) 431-5314

Lines of communication are indicated in Figure 3-1.

4.5 GREEN/SUSTAINABLE REMEDIATION PLAN

This section describes the green/sustainable remediation plan that NRC will implement to promote sustainable technologies and practices for executing the removal action. In general, NRC will adhere to the methodology described by EPA's *Principles for Greener Cleanups*, as described in EPA Publication 542-R-12-002, Methodology for Understanding and Reducing a Project's Environmental Footprint. The methodology includes five core elements:

- Reduce total energy use and increase the percentage of renewable energy
- Reduce air pollutants and greenhouse gas emissions
- Reduce water use and negative impacts on water resources
- Improve materials management and waste reduction efforts
- Protect land and ecosystems.

4.5.1 Methods for Emission Reduction Controls and Policies

NRC will ensure the use of clean fuels, including ultra-low sulfur diesel, biodiesel, and natural gas in equipment and field service vehicles where such fuels are available and compatible with existing equipment engines. Where such equipment is available, NRC will use clean engines including non-road engines meeting Tier 3 or cleaner standards and on-road engines meeting 2006 on-highway Heavy Duty Engine Emission Standards or cleaner. NRC will conduct

equipment operation and maintenance inspections on a daily basis to maximize efficiency. NRC will use electrical power where possible for activities such as water treatment and operation of support facilities. Finally, NRC will implement a policy to enforce an idling time limit of 2 minutes on trucks and equipment used on the project. Engines may be permitted to idle after 2 minutes should one of the following occur:

- Vehicles are stationary in traffic
- It is necessary to operate auxiliary systems associated with the equipment
- It is necessary in the event of repair of the truck or equipment.

4.5.2 Methods for Transportation Minimization and Green Transportation

NRC will offer incentives for use of public transportation or carpooling by site workers. These incentives include gift certificates to shop or dine at local businesses and company-sponsored luncheons at local restaurants for those employees using public transportation or carpools.

In addition, transportation of contaminated soils to the Waste Management Columbia Ridge Landfill will occur by rail from a Seattle transfer station as described in Section 4.9, "Transportation and Disposal Plan." Rail transportation will reduce truck transportation and associated emissions.

4.5.3 Methods of Recycling, Reuse, and Waste Minimization

As described in Section 4.9 of this document, construction demolition debris will be transported to the Republic Services Recycling and Transfer Station approximately 5 miles from the site. At the Recycling and Transfer Station, materials will be sorted by a 2,000-ft sort line in an 80,000 ft² building. Employees, magnets, and specialized equipment capture paper, cardboard, ferrous and non-ferrous metals, glass and plastics from the sort line and prepare them for shipment to recycling mills. Contaminated soils will be used as alternative daily landfill cover at the Waste Management Columbia Ridge Landfill in Arlington, Oregon. Non-contaminated vegetation (i.e., cleared from above grade) will be transported to Pacific Topsoils in Tukwila, Washington, and composted. NRC will purchase local and recycled materials where opportunities are available.

NRC will limit the use of water in dust control by preventing over-watering or runoff. Dry decontamination procedures will be used on equipment and vehicles unless such methods prove ineffective in which case a combination of wet/dry decontamination procedures will be used. For example, wetted recycled towels and rags may be used on equipment tires and buckets in lieu of spraying water.

4.5.4 Use of Local Materials and Facilities

NRC will purchase local and recycled materials where opportunities are available and appropriate. These materials may include aggregates, backfill and general supplies purchased from local vendors.

4.5.5 Environmentally Sustainable Business Practices

NRC will generate and manage construction-related documentation, including, but not limited to, document submittals, requests for information, correspondence, schedules, and drawings. This construction-related documentation shall be submitted in electronic format to the extent practicable, to reduce paper use. In addition, solid wastes generated onsite by workers will be recycled, composted or reused to the extent practicable.

4.6 SURVEYING PLAN

In accordance with Technical Specification Section 01 71 23, NRC has contracted with an independent surveying firm who will be responsible for conducting surveying, field engineering, and related reporting activities. Specified surveying and related field engineering and reporting shall be performed under the supervision of a professional land surveyor with current registration in the State of Washington.

4.6.1 Independent Survey Firm

Duane Hartman & Associates, Inc. (DHA Surveyors)
16928 Woodinville-Redmond Road, Suite B-107
Woodinville, WA 98072
(425) 483-5355 – main
(425) 483-4650 – fax

Firm established:	October 1st, 1993
Company E-Mail Address:	dha.surveyors@frontier.com
Company Website:	www.dhasurveyors.com
Tax ID Number:	91-1616064
Washington State UBI Number:	601-495-674
Certifications:	VOSB - Veteran Owned Small Business
Duns Number:	93-108-5294 (A+ rating)

Responsibilities of DHA Surveyors include the following:

1. Verification of existing monuments, benchmarks, and control points established for the work
2. Establishment of supplemental benchmarks and control points as needed to conduct the work
3. Initial layout of the work
4. Calibration of survey equipment
5. Soil excavation and backfill progress surveys and reporting
6. As-built surveys of all completed work
7. As-built survey of final excavation limits and depths
8. Calculation of construction quantities for Contractor's progress payment requests, as needed
9. Maintenance of the "Project Record" drawings
10. Preparation of as-built construction record drawings.

4.6.2 Survey Firm Personnel

Douglas A. Hartman, PLS #36798, Survey Manager, is a highly experienced surveyor with more than 25 years in the land surveying profession. He has held every position in surveying from field technician to party chief, to licensed professional surveyor. Mr. Hartman is also a specialist in global position system methodology and has conducted numerous construction layout surveys on large, industrial properties. Mr. Hartman is assigned the task of coordinating NRC field staking requests and QA/QC of survey data.

Mark Chaney, Party Chief, reports to the survey manager and works with the project manager assigned to the job. As party chief, Mr. Chaney interprets plans, makes all field calculations, keeps detailed and accurate field notes, maintains control of all work done by his crew, and communicates with clients at the job site. He has the authority to assign work to crew members and determine methods to accomplish assigned tasks. Mr. Chaney is 40 hour HAZWOPER certified and will participate in the field surveying.

4.7 UTILITY PROTECTION PLAN

NRC will implement measures to protect existing utilities at the T-117 Removal Action Site per Section 1-07.17 of the Standard Specifications (City of Seattle 2011). Utilities present at and near the site include surface and subsurface utilities. In general, the excavation depths for the planned soil removals are too shallow to contact known buried utility lines. However, hand excavation or air/hydro Vactor truck removal will be performed in any areas expected to be within 3 ft of an underground utility line until the line is located. Also, care will be taken when

excavating beneath active overhead power lines to keep all personnel and excavation equipment at least 10 ft away.

4.7.1 Location and Identification of Utilities

Certain active utilities in the areas of the work have been identified on the contract drawings. NRC will not consider these locations exact or complete. All reasonable actions shall be taken to further locate utility services in the vicinity of the project prior to excavation and subsurface work. This may include the following:

- Reviewing information and correspondence already held by the City or owners relating to utility services.
- Conducting additional research to further identify and verify the location of services along the project. This may include consultation with utility asset owners, utilizing “call before you dig” services and other inquiries.
- Conducting an independent third party utility locate and physical searches in the field (asset location surveys, potholing, etc.) to positively verify the location of services within or immediately adjacent to the project boundaries.
- Consulting with each of the service providers to share knowledge of asset locations and confirm requirements for relocation or protection.

4.7.2 Utility Protection

NRC will protect all known or suspected utilities including but not limited to existing utility lines, poles, wires, cables, transformers, risers, junction and meter boxes, vaults, and stormwater catch basins. Protection of these utilities will include the following:

- Establish a zone of protection around each surface feature located near the work areas and delineate each zone with brightly colored flags, signs, cautionary tape, or equivalent. Delineators shall be readily visible from the operator’s position of motorized equipment.
- To the extent practical, establish equipment travel routes that are not in close proximity to surface features, and place physical barriers between the utility feature and travel or work zones to prevent damage due to anticipated construction activities.
- Maintain adequate cover or install equivalent protective measures to prevent damage to utilities from traffic loads and construction activities.
- Provide adequate physical support of active utilities within or near the soil excavation area.

- Hand excavation or air/hydro Vactor truck removal will be performed in any areas expected to be within 3 ft of an underground utility line until line is located.

4.7.3 Notification

NRC will promptly notify the owner and applicable utility purveyor in the event an unknown utility line is encountered or a line is encountered that conflicts with completion of the work. NRC will not abandon, remove, relocate, or replace any utility line without prior approval from the owner and applicable utility purveyor.

In accordance with RCW 19.122.030, NRC will notify the Utility Notification Center prior beginning subsurface work. The 24-hour Utility Notification Center for the site location is 1-800-424-5555.

4.8 POLLUTION CONTROL AND MITIGATION PLAN

NRC will implement the following pollution control and mitigation measures in accordance with the requirements of Technical Specifications Section 01 57 50 – Temporary Environmental Pollution Control. The intent of these measures is to protect water and air quality, prevent spills and sedimentation, and minimize noise pollution.

4.8.1 Temporary Erosion and Sediment Control Plan

NRC will implement temporary erosion and sedimentation control measures in accordance with Volume 2 of the Seattle Stormwater Code (City of Seattle 2009) and Section 00 72 00 of the technical specifications in Appendix A of the RADR (Integral 2012). Although a Construction General Permit is not required for this project, these measures will be implemented and updated as necessary by NRC.

Temporary erosion and sediment controls that will be implemented at each of the affected properties during excavation and site restoration will include silt fencing or fiber rolls placed around the active construction area and inserts placed within all nearby stormwater catch basins. In addition, “track out” will be managed by establishing sidewalk crossings, manual decontamination and removal of soil from equipment. Given the confined nature of the excavations, no further erosion and sediment control measures are expected to be needed. However, in the event that field conditions warrant additional measures, NRC will implement them as necessary to prevent the offsite transport of eroded soils. The additional measures will be selected from Volume 2 of the City’s Stormwater Code (City of Seattle 2009).

NRC will protect the “clean” excavated areas of properties during construction activities utilizing a number of different protection methods available and applicable to many of the sites. During storm events, NRC will cover the clean excavated areas with plastic sheeting to the

extent possible to minimize or eliminate run-on and runoff potential due to rain impacting exposed soil. Exposed contaminated areas up gradient of a clean excavated area will be covered with plastic to the extent possible to minimize or eliminate cross contamination from contaminated runoff.

At the interface of the contaminated and clean soil rain runoff water will be diverted via a trench, ditch, berms, etc to a sump or low spot within the excavation where water will be allowed to infiltrate or, if necessary, removed by vacuuming. From the NOAA website for Seattle the maximum daily rain amounts in December, January and February are 1.93, 1.66 and 0.74 inches, respectively. It is anticipated that NRC will be working on or have less than 2,000 ft² of area "exposed" at any given time. Based on an area of 2,000 ft² a daily precipitation of 2 inches would generate approximately 2,500 gallons of runoff volume. NRC's 70-barrel vacuum trucks are capable of holding approximately 3,000 gallons. If contaminated soil sloughs into a clean area or clean areas are re-contaminated by some other occurrence, contaminated soil will be removed from the clean area and the affected clean area will be re-scraped prior to continuing normal excavation activities. The procedures to be followed for the transport and disposal of contaminated stormwater are described in the Transportation and Disposal Plan, presented in Section 4.9 of this RAWP.

NRC will implement the required BMPs and manage stormwater in accordance with all applicable federal, state, county, and local laws, statutes, ordinances, and regulations. Mr. Scot Overdick, the project supervisor for NRC, is a Certified Erosion and Sediment Control Lead and will be responsible for environmental controls on the project, including erosion and sediment control. Mr. Overdick's certification and contact information is below.

Scot Overdick
Certified Erosion and Sediment Control Lead Certification # 8241306
Expiration: 08/24/2013
Cell Phone: (425)417-5344
Office Phone: (206) 607-3000

Mr. Overdick will conduct temporary erosion and sediment inspections and will have the authority to allocate and utilize the necessary resources to implement, maintain, and modify stormwater and temporary erosion and sediment control BMPs as required. Temporary erosion and sediment control inspections will be conducted daily and will be recorded in the daily QC report.

4.8.1.1 Best Management Practices

A variety of BMPs will be utilized on the project many dependant on the specific location and application requiring the BMP. These task or area specific BMPs may include but are not limited to plastic sheeting with sandbags for stockpile covers, geotextile-plastic-plywood for sidewalk

crossing, plastic sheeting with boom berms for bin loading area, silt fence or fiber rolls encompassing areas disturbed, catch basin protectors, and regular manual sweeping of work area to collect and remove any fugitive material. Additional BMPs will be implemented as required to minimize or eliminate the erosion of materials at the site(s). See Section 4.9, "Transportation and Disposal Plan," for additional details on loading zone BMPs.

NRC will proceed with the yard remediation in the following general manner for the excavation, containerizing, transport, and disposal of contaminated soil. With the work area delineated, NRC will place plastic sheeting beneath the bin staged for receiving contaminated soil and debris. The plastic sheeting will cover the clean soil and sidewalk along the designated travel route from the work zone to the bin. Sheets of plywood placed on top of the plastic sheeting will be utilized to cross the sidewalk to the bin. Geotextile, boom, sand bags, ramps, and other supplies will be utilized as required to supplement this basic layout as determined by field conditions encountered.

4.8.1.2 BMP Inspection and Maintenance

BMPs will be installed prior to any ground disturbing activity. The area disturbed at any time will be kept to a minimum to reduce the potential surface area exposed to the elements which may erode at any given location or property. The BMPs will be inspected at least once a week and within 24 hours of runoff events in which stormwater discharges from the site. Any BMP deficiencies identified during weekly or event driven inspections will be repaired or replaced immediately. Weekly and event driven inspections will be documented. Specific BMPs will remain in place, operable, and continue to be inspected until work in that runoff area is complete or NRC is directed to remove the BMPs.

4.8.2 Spill Prevention Control and Countermeasures Plan

This section was developed per Contract Specification Section 01 57 50 and consists of information on how NRC will plan for, install, inspect, maintain, and remove pollution prevention BMPs. The purpose of this plan is to develop administrative and physical measures appropriate to work performed under the contract to prevent the pollution of soil, air, and water, and to control, respond to, and dispose of potential pollutants or hazardous materials during the life the of the contract. This plan applies to all areas associated with contract work including, but not limited to, work areas; equipment and material storage areas; and staging areas. This plan will be revised and modified as needed during the life of the contract.

NRC will implement the following spill prevention BMPs:

Hazardous Material Transfer

- All hazardous materials will be transferred from primary to secondary containers using secondary containment.

Vehicle and Equipment Fueling

- All equipment fueling operations will utilize pumps and funnels and absorbent pads.
- Fueling will take place within a hydraulically isolated (containment) area that does not drain to any natural or manmade drainage conveyance including ditches, catch basins, ponds, wetlands, or pipes.
- Fueling will be restricted to designated fueling areas.
- A spill kit will be located within 100 feet of any fueling operation.

Vehicle and Equipment Maintenance

- Engine, transmission, and hydraulic oil may be added, as needed utilizing funnels and drip pans.
- Absorbent pads will be placed to prevent fluid contact with soil.
- No used engine fluids will be stored on the project site.
- No vehicle maintenance other than emergency repair will be performed on the project site.

Small Engine Fueling and Maintenance

- All small engine fueling operations will utilize funnels.
- Absorbent pads will be placed to prevent fluid contact with soil.
- Fueling will take place within a hydraulically isolated (containment) area that does not drain to any natural or manmade conveyance.
- Contractor will not drain and replace engine fluids on the site.
- Engine fluids may be added, as needed utilizing funnels.
- Fluid addition will be done over drip pans.
- Absorbent pads will be placed to prevent fluid contact with soil.

Spill Kits

- NRC has spill kits in varying sizes from 5 gallon bucket to 55 gallon drum. The main differences between the kits of varying size are the number or amount of materials provided in a specific kit. Each kit contains the following items:
 - Container (5–55 gallon bucket or drum)

- Absorbent pads (usual 17" x 19" x 3/8" sheets up to 100 sheets)
- Absorbent boom or sock (usual 5" x 10' boom up to four lengths)
- Absorbent material (Absorb X, Floor Dry or Chemical Stabilizer 25-50# bag)
- Protective gloves (usual heavy duty butyl rubber)
- Goggles
- Drum Liner bag
- Spill Kit Label
- Optional Items
 - Banner tape
 - Duct tape
 - Cotton rags
 - Chemical pads
 - Vermiculite
- Spill kits will be stored at designated locations on the project site and made readily available.

Material Storage

Solid chemicals, chemical solutions, paints, petroleum products, solvents, acids, caustic solutions, and any waste materials, including used batteries, shall be stored in a manner that will prevent the inadvertent entry of these materials into waters of the state, including groundwater. Storage shall be in a manner that will prevent spills due to overfilling, tipping, or rupture. In addition, NRC shall implement the following specific requirements:

- All liquid products will be stored on durable, impervious surfaces and within a bermed area or other means of secondary containment capable of containing 110 percent of the largest single container volume in the storage area.
- Waste liquids shall be stored under cover, such as tarps or roofed structures in addition to secondary containment. Any waste storage areas, whether for solid waste or hazardous waste, shall be clearly designated as such and kept segregated from products to be used on the site.
- In the event that a designated hazardous material storage area has been identified and approved by the Engineer, NRC will store only hazardous materials specific to the project work in the storage area.

- All hazardous materials and waste containers will be stored with the container lid secured, to prevent spills or leaking.

4.8.2.1 Emergency Response

As NRC is an emergency response contractor, any emergency response required for a spill, environmental, or hazardous materials incident will be managed by NRC's own forces. NRC personnel and equipment remain on standby 24 hours a day, 7 days a week in all of NRC's West Coast offices. In addition, all standby personnel are trained in chemical response, health and safety, hazardous waste operations, and in the appropriate procedures for the proper use of personal protective equipment levels D through A.

A response is initiated by calling NRC's 24-hour hotline (1-800-337-7455) through which NRC's call center notifies an NRC Emergency Response Manager. The Emergency Response Manager will request basic information on the release, such as contact phone number, location of the release, type of material released, material safety data sheets for the material released, estimated amount released, and a description of the area affected by release. The Emergency Response Manager will then mobilize required crew and equipment based on the description provided or as requested by the City or EPA, immediately following the call. NRC's Seattle office is located approximately 2 miles from the T-117 site.

The first task in a response action is to contain the spill to minimize environmental degradation and to protect health and safety. The hazardous materials are then collected and packaged for disposal with follow-up sampling and analysis conducted as required to verify the cleanup. At all times, NRC personnel cooperate closely with local, state, and federal agencies.

4.8.3 Air Emissions Control

NRC will implement all necessary provisions for air emissions control. The primary objective of this section is to formulate a strategy for controlling, to the greatest extent practicable, fugitive or airborne dust emissions and odors at the site. This will be accomplished by identifying specific sources and activities that have the highest potential to produce or generate fugitive dust emissions or odors. This plan describes the engineering controls necessary to minimize and control dust emissions from those sources and activities. As necessary, the scope of this plan will be revised to reflect changes in dust control strategy as site conditions or activities may change in the future.

Sources of Air Emissions

Potential sources of air emissions or odors on the project include, but are not limited to the following:

- Vehicle traffic on access roadways
- Vehicle traffic in contaminated work areas
- Excavation and handling of contaminated soil and debris
- Stockpiling of soil and other construction materials
- Demolition and debris size reduction
- Material handling and transfer operations
- Decontamination activities
- Wind erosion
- Excavation backfilling activities
- Combustion emissions from internal combustion engines
- Free product or contaminants exposed or unearthed during site operations.

Corrective Actions

NRC will continuously implement all air monitoring and emissions control provisions as identified in Table 4-2. Daily site safety meetings will reinforce the need for all workers to be cognizant and responsive to conditions or activities that generate visible dust or odors. The project supervisor will be notified immediately if excess dust or odors are observed, or if conditions exist where dust could be a problem. Corrective actions will then be implemented as described below. The sequential corrective action task list for the elimination of fugitive dust and odors at this site is as follows:

1. Reduce the pace of, or cease, dust producing activity until the problem is corrected
2. Notify the project supervisor of dust conditions and implement dust suppression procedures
3. Remove accumulated dirt and soil from problematic areas, and/or cover, enclose, or isolate dust-generating areas/surfaces to shield them from wind, sunlight, or heat sources
4. Increase frequency, volume, and/or coverage of water to prevent soil and dirt from drying
5. Provide additional dust suppression systems and staff during the task duration
6. Modify operating procedures and methods to eliminate problematic conditions
7. Increase level of worker awareness and instruct them on implementation of any new or modified operating procedures
8. Report and document all procedural modifications and results

9. Perform routine audits of dust suppression methods and work areas for dust sources.

4.8.4 Noise Pollution Monitoring and Control

NRC will take all reasonable measures for the suppression of noise resulting from operations. Mobile engine-driven loaders and similar material-handling equipment; engines used in stationary service for standby power; air compressors for high and low pressure service; and other similar equipment shall be equipped with exhaust and air intake silencers designed for the maximum degree of silencing. The type of silencer required is that for use in critical noise problem locations such as high-density residential, hotel, and hospital areas. NRC will also use low-frequency backup alarms where practicable.

NRC will conduct performance of the Work consistent with the applicable noise control levels set forth in Seattle Municipal Code Chapter 25.08. For construction equipment in residential areas during daytime hours (i.e. between the hours of 7:00 AM and 10:00 PM weekdays and 9:00 AM and 10:00 PM weekends) the maximum permissible sound level is 80 decibels. NRC will consider noise ordinance requirements when developing or making changes to the Critical Path Schedule.

Additional noise mitigation measures/adjustments will be made to address resident complaints regarding noise to the extent practicable. Additional noise mitigation may include implementation of the following if necessary:

Design Considerations and Project Layout

- Construct noise barriers, such as temporary walls or piles of excavated material, between noisy activities and noise-sensitive receivers.
- Reroute truck traffic away from sensitive areas, if possible. Select streets with fewest homes if no alternatives are available.
- Construct walled enclosures around especially noisy activities or clusters of noisy equipment. For example, shields can be used around pavement breakers and loaded vinyl curtains can be draped under elevated structures.

Sequence of Operations

- Combine noisy operations to occur in the same time period. The total noise level produced will not be significantly greater than the level produced if the operations were performed separately.
- Avoid nighttime activities. Sensitivity to noise increases during the nighttime hours in residential neighborhoods.

4.9 TRANSPORTATION AND DISPOSAL PLAN

This section contains information on how NRC will manage the removal of all hazardous materials, contaminated soils, solid waste and waste generated from contract operations. NRC will implement the following:

1. For the purposes of this section, “clean” shall be defined as the work site being free of all hazardous materials, wastes, containers, containment devices, scrap materials, used spill pads or absorbent pads, or any other hazardous material debris resulting from NRC’s activities.
2. The City will retain title to all hazardous waste and materials currently on site encountered during demolition, removal, and excavation. This does not include hazardous materials generated by NRC, such as used motor oils, paints, lubricants, cleaners, spilled materials, etc. NRC will be the generator and owner of these wastes and shall clean and dispose of such waste according to the contract documents and follow local, state, and federal regulations. The City will be shown as the waste generator and will sign all waste manifests and/or bills of lading for non-contractor generated wastes. Nothing contained within this plan shall be construed or interpreted as requiring NRC to assume the status of owner or generator of hazardous or solid wastes for non-contractor generated hazardous wastes.
3. Hazardous material(s), solid wastes and special waste(s) shall be disposed in a fully permitted disposal facility with the approvals necessary to accept the waste materials that are disposed.
4. Contaminated materials, such as absorbent materials, rags, containers, gloves, shall be collected and placed into labeled containers and/or roll-off boxes.
5. Any unanticipated hazardous materials or waste, or contaminated soils encountered during construction that are not generated by NRC shall be immediately brought to the City’s resident engineer’s attention for determination of appropriate action. NRC will not disturb such hazardous materials or contaminated soils until directed by the City’s resident engineer.

As described in the RADR (Integral 2012), total PCB concentrations in the Residential Yards soil to be excavated range from 0.47 to 12 mg/kg and the total PCB concentration in the southern alley soil to be removed ranges from nondetected to 30 mg/kg. This concentration of PCBs classifies the contaminated soil for removal as “bulk PCB remediation wastes with a PCB concentration of < 50 ppm.”

Because the source of PCBs is not from a documented source of “discarded transformers, capacitors or bushings containing PCBs at concentrations of 2 parts per million or greater” or from the “salvaging, rebuilding, or discarding of transformers, capacitors or bushings containing PCBs at concentrations of 2 parts per million or greater”, the Washington State

Dangerous Waste designation of WPCB is not applicable (WAC 173-303-9904). In addition, the soil will not be designated as a Washington State criteria waste under WAC 173-303-100, a characteristic waste under WAC 173-303-090 (or 40 CFR 261 Subpart C), or a listed waste per WAC 173-303-080 (or 40 CFR Part 261 Subpart D).

All waste removed from the project site will be managed as solid waste at an appropriately permitted municipal solid waste landfill (RCRA Subtitle D Landfill) or a permitted solid waste handling facility. In the event that hazardous or dangerous wastes are encountered or generated on the project, these materials will be designated in accordance with the procedures outlined in WAC 173-303 and disposed of at an appropriately permitted RCRA treatment, storage, and disposal facility.

The proposed facilities to be used on the project are listed in Table 4-3.

NRC anticipates that all contaminated soils will be placed in 20–30 CY, lined and tarped/lids roll-off boxes. The boxes will be staged near the work areas each workday and removed to the designated roll-off staging location shown on the site plan (see Appendix C) at the end of each day. Boxes will be transported by transfer trucks to the Alaska Street transfer station in accordance with the haul routes shown on Figure 4-1 and the site plan in Appendix C. An estimated 2–4 roll-off transfers from the designated staging area to the transfer facility will occur per day.

As the loading of trucks will occur locally at each individual yard, there will be no fixed loading zone for the duration of the project. Trucks and/or containers will be loaded adjacent to excavation areas such that the vehicle does not enter areas where soil has been disturbed. Excavated soil loading areas will include the following features to contain accidental spillage and prevent track-out.

- A tarp will be used to line the loading area, and area between the excavation area and the loading area, to capture any spilled soil. Spilled soils will be shoveled into the dump truck or roll-off container.
- Temporary berms (e.g., straw wattles or similar) will be placed along the loading area perimeter to prevent offsite run-on from entering the loading area.
- A sump will be provided to capture stormwater from the loading area. Storm water collected within the loading area will be pumped to a temporary storage tank or a Vactor truck for disposal at an approved treatment facility.
- Because trucks will not be entering an area where soil has been disturbed, a wheel wash will not be provided. However, a pressure washer will be available in the event that spilled materials need to be removed from loading vehicles. Wash water will be collected in a sump and pumped to a temporary storage tank or a Vactor truck for disposal at an approved treatment facility.

The project supervisor will record daily shipments of contaminated soil and will retain weight tickets for all soil shipped off-site. These records will be matched to the certificates of disposal provided by Waste Management for “cradle to grave” disposal documentation.

No hazardous waste manifests are anticipated to be required for any waste generated on the project site. All waste will be shipped on bills of lading and disposal permits provided by the receiving facility or standard bills of lading produced by NRC. Should the need for manifesting arise, NRC has staff with commercial driver licenses and hazardous materials endorsements as well as staff with training and certification per 49 CFR 172 Subpart H.

4.10 TRAFFIC CONTROL PLAN

Trucks and worker vehicles will be used to move materials, equipment, and workers during construction activities. These vehicles will temporarily, but unavoidably, add to traffic on local streets and highways and will increase demand for parking in the area. However, the project is designed to reduce the number of vehicles used, limit when and where vehicles travel through neighborhoods, and require several other safety procedures intended to reduce the likelihood of accidents. The types and purposes of project vehicles include the following:

- Trucks, flatbeds, and other large vehicles to transport construction materials, heavy equipment, excavated soil, backfill, and debris
- Heavy equipment, such as backhoes, loaders, and compactors maneuvering from flatbed trucks to work zones or travelling between work zones
- Small trucks and cars to transport construction workers, sampling teams, regulatory oversight personnel, authorized visitors, and others needed to perform the work.

The primary means of minimizing impacts from traffic and parking involve the following design and staging considerations:

- Trucks traveling to and from the neighborhood will generally use the haul routes identified on Figure 4-1. Based on the total volume of excavation and backfill, approximately 60 trucks are expected over a 2 month time period.
- Trucks and project vehicles will comply with local speed limits, traffic laws, and regulations regarding maintenance, placards, securing/covering loads, and other safety measures.
- Dedicated flaggers will be present to direct all truck and equipment operations in all active work zones throughout the duration of the work.
- Construction equipment will have audible backup alarms to warn workers and the public of moving equipment.

- Traffic and access restrictions will be clearly posted and communicated to both residents and workers as site conditions change.
- Drivers of diesel trucks and other equipment must obey all Washington traffic laws, including idling no longer than 2 minutes on local streets. Idling will not be permitted on neighborhood streets.
- Trucks will be staged on the portions of S. Donovan Street and Dallas Avenue S. to the east of 17th Avenue S. and/or on Port property. NRC will have a traffic control plan to ensure safety and business continuity to the local neighborhood. In addition, Caffè Umbria will be contacted prior to the start of construction to discuss any specific constraints on staging.
- Workers will be encouraged to carpool to the site to reduce the strain on parking and traffic. Workers will park within designated areas on portions of S. Donovan Street and Dallas Avenue S. to the east of 17th Avenue S. and/or on Port property. No more than 12 construction workers are anticipated to be involved in the Residential Yards cleanup at any one time.

Workers will park only in designated staging areas within the site. Visitors observing construction activities may park in designated public spaces around the site for brief periods of time.

Traffic control details will vary by location and project phase as construction progresses. NRC will obtain street use permits from the Seattle DOT and revise the affiliated traffic control plan as necessary to address changes due to the construction progress. A Seattle DOT Checklist for development of the required traffic control plans is included in Appendix F. Traffic control plans will be developed in accordance with the requirements of Section 1-10 of the Standard Specifications, Temporary Traffic Control (City of Seattle 2011) and will address plans for protecting and controlling pedestrian and vehicular traffic during construction operations. Traffic control plans will indicate the following:

- Any traffic control issues on nearby rights-of-way (e.g., temporary lane closures and traffic flaggers for trucks entering and leaving the site)
- Coordination with adjacent residents and nearby businesses
- Contractor parking
- On-site traffic and pedestrian control measures
- All site access and security measures.

4.11 CLEARING, DEMOLITION, AND EXCAVATION PLAN

This plan has been developed in accordance with Section 31 00 00 of the technical specifications and includes information on how NRC will clear, demolish, and excavate materials during implementation of the project.

4.11.1 Clearing and Demolition

Clearing will consist of activities associated with Task 3 of the methods identified in Section 4.1.1 of this document. After site controls have been established, all surface obstructions that are not intended to be undisturbed will be removed and either stored for later restoration, or disposal. Existing features (e.g., concrete walkways) and vegetation to be removed from each of the affected yards are shown on the construction documents.

Temporary site obstructions such as parked vehicles blocking loading zones or personal items (e.g., lawn furniture, tools, toys, garden gnomes) located in areas to be excavated are expected to be avoided by pre-construction coordination with the property owner and by posting parking restrictions (in accordance with street use permits from the Seattle DOT). Should a temporary obstruction that disrupts the planned construction activities occur, NRC's project supervisor and the City's resident engineer will attempt to identify and contact the owner of the obstruction to coordinate its prompt removal. If the owner cannot be located promptly, NRC's project supervisor will confer with the City's resident engineer and the agency construction oversight manager to determine a course of action for removal of the obstruction.

Soil adhering to removed materials to be recycled or reused will be removed using a physical abrasion method, such as brushing, to attain a clean surface. Removed materials that cannot be recycled or reused will be disposed of at the approved solid waste landfill. Any removed materials that are intended to be returned to the site during restoration will be temporarily stored within the staging area until needed.

Vegetation to be cleared will be cut above grade and transported to the approved "Clean Green" recycling facility for mulching and/or composting. Vegetation below grade will be grubbed and transported to a Subtitle D landfill, together with excavated soil. The contaminated soil will be profiled with up to 25 percent miscellaneous debris to include items to which soil is adhered and cannot be efficiently removed. These items will be disposed of along with the contaminated (non-TSCA) soil.

Buildings, porches, patios, and other items requiring demolition and removal will be removed prior to or in conjunction with removal of contaminated soils. Many of the structures will be dismantled for reuse or to minimize the spread of contamination. Water sprays will be utilized as necessary to minimize or eliminate dust and cross contamination. Materials will be segregated to the extent possible, placed in containers or trucks for recycle. Materials not

suitable for recycle will be placed in containers or trucks for disposal at a licensed disposal facility.

4.11.2 Excavation

Details on the planned extent of soil excavation at each of the affected yards, alleyway, and planting strips are shown on the construction drawings. Yards excavation will be based on a depth below ground surface (and associated elevation) that may vary across the decision unit. For the planting strips and alleyway, target excavation elevations for each decision unit are determined by subtracting the depth of contamination from the lowest elevation within that unit. The addresses for the affected yards, approximate removal volumes and a brief description of the planned removal activities are as follows:

- 8523 Dallas Avenue S.—Removal of 120 CY of soil. The required depth of excavation is 12 inches. A paved driveway will be removed and replaced with gravel. A concrete walk will be removed and replaced. An existing shed will be removed.
- 1410 S. Cloverdale Street—Removal of 260 CY of soil. The required depth of excavation is 24 inches. A brick patio and a flagstone path will be removed and replaced. An existing shed will be removed.
- 1421 S. Cloverdale Street—Removal of 20 CY of soil. The required depth of excavation is 18 inches.
- 1425 S. Cloverdale Street—Removal of 205 CY of soil. The required depth of excavation is 24 inches. A concrete walk will be removed and replaced.
- 1440 S. Cloverdale Street—Removal of 255 CY of soil. The required depth of excavation is 12 inches. A concrete walk and a gravel driveway will be removed and replaced.
- 1445 S. Cloverdale Street—Removal of 45 CY of soil. The required depth of excavation is 6 inches.
- 1418 S. Donovan Street—Removal of 95 CY of soil. The required depth of excavation is 24 inches. A concrete walk will be removed and replaced.
- 1430 S Donovan Street – Removal of 15 CY of soil. The required depth of excavation is 6 inches. A brick and mortar landscaping wall will be removed and replaced with a stone block gravity wall. A gravel driveway will be provided in a portion of the front yard used for parking.
- S. Cloverdale Street planting strips—Removal of 225 CY of soil. The required depth of excavation ranges from 12 to 24 inches, based on specific location. Final excavation depths for the planting strips on the south side of the street will be determined by sampling during excavation. Sidewalks may be notched and street trees will be cleared

and replaced with tree varieties consistent with Seattle DOT requirements. As many as 20 trees may be required.

- Alleyway between S. Cloverdale and S. Donovan Streets—Removal of 495 CY of soil. The required depth of excavation ranges from 12 to 36 inches, based on specific location. The existing gravel topping will be removed, together with the underlying soil. The alleyway will be restored to a gravel surface.

NRC will excavate most yards utilizing a mini-excavator, skid steer loaders, vacuum truck, and air knife. The combination of these major pieces of equipment will be utilized as appropriate for individual properties. Yards will generally be divided into two sections, the left and right side of the house with the front and back sidewalks as a dividing line. Excavation activities will begin at the point furthest from the bin on one side of a house. The excavator will sit on the contaminated soil excavating and pulling material to the machine. The soil will be placed in the skid steer loaders which will transport the soil via the designated haul route to the bin. Once the area within the excavator's reach has been excavated, the smooth edge bucket of the mini-excavator or a grade beam will be used to perform a final scrape of the excavated area. This scraping will remove any remaining or spilled soils while providing a smooth final grade. Spill aprons will be placed around bins to catch material that may fall from excavation equipment.

Excavations will continue along the leading edge of the contaminated area proceeding from the back of the property to the front. Excavation equipment will be operated from on top of the contaminated soil to the extent possible. In areas where equipment must cross or work from a clean area the clean area will be covered with plastic sheeting in the areas where equipment must travel or sit to operate.

Special care is required when excavating within 2 ft of building foundations, utilities, and within the drip lines of mature trees and bushes to remain, in order to avoid damaging their roots. Hand digging or excavation with air/hydro Vactor equipment is required within the drip line of vegetation at the extents of the canopy area, and within 2 ft of foundations and utilities, and may be limited to 6 inches as needed to avoid roots. In addition, excavation will be held to a shallow depth of 2 to 6 inches within a plant's critical root zone, measuring half of the diameter of the drip line. If air/hydro Vactor equipment is used, low pressure will be used to prevent root damage.

All excavated soils and demolition debris intended for offsite disposal will be placed either directly into a dump truck, roll-off bin, or similar container. Because of limited space available at the affected properties, the loading areas will likely be located in the street immediately adjacent to the property.

When disposal bins are sufficiently full, NRC will complete the appropriate manifest and transport the bin to the appropriate facility for disposal. For additional descriptions of the transportation and disposal process refer to Section 4.9, "Transportation and Disposal."

4.11.3 Equipment Decontamination

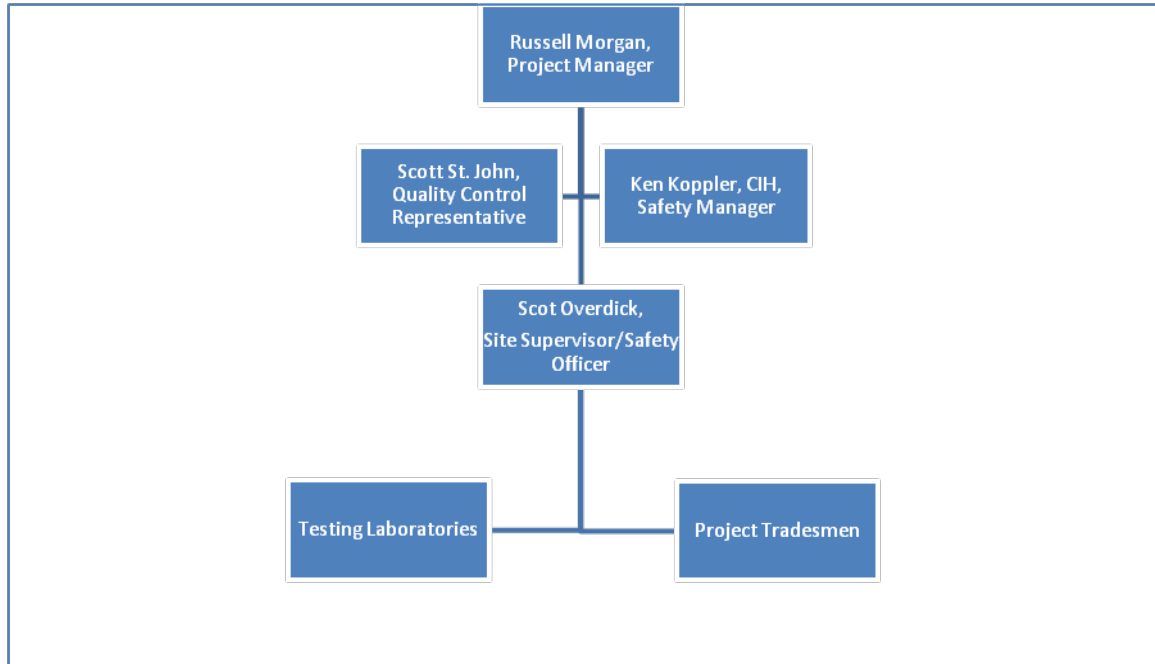
NRC will decontaminate equipment using a dry decontamination method. Equipment requiring decontamination will be parked on a sheet of plastic. Technicians will use brooms, shovels, scrapers, and other implements to remove dry material from the equipment. Contaminated material dislodged from the equipment onto the plastic sheet will be swept up and placed with the plastic sheeting in the soil bin for disposal when the decontamination is complete.

Excavation equipment will be decontaminated prior to handling of clean backfill materials or prior to release from the site. Once equipment is dry-decontaminated, it will be inspected prior to release from the site. Items not totally cleaned or badly stained by operations will be wet-decontaminated in conjunction with the dry-decontamination process. If the inspection indicates that wet decontamination is required the technicians will use water or water and soap soaked rags to wet decontaminate the equipment. Rags will be collected and disposed of offsite at an appropriate facility. A final inspection of the equipment will be performed prior to release from the site.

4.12 CONTRACTOR QUALITY CONTROL PLAN

This quality control plan has been prepared in accordance with Section 01 45 00 of the technical specifications and identifies the personnel, procedures, control, instructions, tests, records, and forms to be used.

The quality control organization for the project is as follows:



NRC Project Quality Control Organization

NRC will conduct construction QC inspections, sampling and testing, and monitoring activities to ensure compliance with the terms and conditions of the contract. NRC will coordinate assembly of all submittals and verify them for accuracy, completeness, and compliance with the contract requirements prior to transmitting to the City's resident engineer. Each submittal shall have a submittal cover sheet that includes the submittal number, contractor's contact information, project title and public works number, transmittal date, description, and contract references. To the extent practicable, all submittals, including test results and reports, will be in electronic form to reduce paper use.

Daily quality surveillance inspections will be conducted by the project supervisor. Other quality tests, inspections or measurements may be conducted by the following subcontracted firms:

- Robinson Noble (Geotechnical/Soil Testing)
- Analytical Resources Inc. (Environmental Laboratory)
- Duane Hartman & Associates, Inc. (DHA Surveyors), Independent Surveyor Firm
- Teufel Landscaping, Landscaping Subcontractor

A copy of all tests performed by a testing laboratory will be provided to the City's resident engineer, turned in with the daily report. All testing to be performed will be recorded on the testing plan and log. The testing plan and log are included as Appendix G.

If QC testing indicates that an item is noncompliant with QC protocols, it will be identified on the daily QC report and the City's resident engineer will be notified. If possible the deficiency will be repaired or replaced as soon as it is known. Repairs or replacements will also be noted in the daily QC report. If NRC is unable to correct the deficiency, the situation will be discussed with the City's resident engineer. NRC and the City's resident engineer will develop a plan to correct or replace the deficiency. All testing, deficiency, and correct actions will be documented in the daily QC report.

The QC representative will be responsible for listing items needing rework, including those identified by the City's resident engineer. The results of all quality control inspections, including those deficiencies noted and corrected on the spot, will be recorded by the QC representative and discussed at the weekly QC meeting. A copy of this report, with results and corrective actions taken, will be forwarded to the City's resident engineer. The original report will be filed at the job site trailer and will be made available as requested.

4.13 SITE RESTORATION PLAN

This site restoration plan has been prepared in accordance with Section 32 00 00 of the technical specifications.

Following soil excavation, each property will be backfilled with imported soil to the grades shown in the construction drawings. All imported backfill material will be obtained from sources that meet the requirements of the technical specifications (RADR, Appendix A; Integral 2012) and consistent with the City of Seattle Standard Specifications for Road, Bridge and Municipal Construction (City of Seattle 2011).

At this time, backfill and aggregate for the project will be provided by Miles Sand & Gravel of Puyallup, Washington, and Pacific Topsoils of Everett, Washington, from its Tukwila location. NRC will submit a list of import material sources, along with available physical and chemical characterization data, to the City and EPA for approval no later than 14 calendar days prior to the commencement of construction. If chemical or physical testing of the materials is required, sample collection and testing will be performed by the City's QA officer.

Import materials will be delivered on an as needed basis to individual properties. Delivery of import materials (import) will be limited to the amount that can be placed by the end of the shift. Import may be temporarily stockpiled onsite or on the street along the curb at the designated property. Import stockpiled on the street will be placed on geotextile material and surrounded on the three street sides with temporary fencing. The import will be installed in a manner similar to the excavation process. Import will be placed using a mini-excavator, skid steers, and manual application starting at the furthest point from the stockpile area and proceeding to the stockpile area. This method will minimize or eliminate the need to travel on import soil once it is placed.

Backfilling will be performed as soon as practicable (e.g., within 24 hours) after completing excavations at each property, and obtaining City and EPA approval of survey confirmation and visual inspection, to minimize potential safety hazards to the community caused by open excavations. NRC will maintain site access controls until backfilling and grading activities have been completed. Site access controls may also be necessary after backfill has been placed, until landscape restoration has been completed.

In accordance with the City's green stormwater infrastructure practice of providing appropriate soil quality and depth, compost amended topsoil will be provided within all non-paved areas that have been disturbed by the removal action. Compost amended topsoil shall be a mix of 20-35 percent compost and 80-65 percent mineral soil, placed at a minimum 8-inch depth over 4 inches of scarified sub-soil (unclassified borrow). It shall contain no more than 5 percent clay or silt fines (passing No. 200 sieve). The imported topsoil shall be compacted to no more than 85 percent modified maximum dry density.

Landscaping of each property will be performed by NRC and the Landscaping Subcontractor in accordance with the construction drawings and technical specifications. This includes the replacement of removed hardscape and landscaping (i.e., seed, sod, plantings, shrubs, and trees). NRC will be responsible for a one-time replacement of plantings that are not alive and healthy after a period of one year, provided the plants have been maintained according to the maintenance agreement between the City and the property owner/tenants. Responsibility will be voided if the plantings have not been appropriately maintained (e.g., watering, weeding, mowing), or in the event of damage due to fire, floods, freezing rain, lightning storms, wind gusts over 75 miles per hour, acts of vandalism, or negligence. Routine maintenance and care will be the responsibility of the property owner/tenants. A maintenance memo will be provided to homeowners and tenants, which will explain the maintenance and regimented watering needs of the landscaping. Immediately following substantial completion, the City will request concurrence from the property owner/tenants that the restoration work meets the previously accepted restoration drawings.

5 CONSTRUCTION QUALITY ASSURANCE

Construction QA will be managed in accordance with the EPA approved CQAP included as Appendix B of the RADR (Integral 2012). This section summarizes key elements of the construction QA activities and provides additional details on management of the construction QA program.

5.1 SUBMITTAL MANAGEMENT

NRC coordinates assembly of all submittals and verifies them for accuracy, completeness, and compliance with the contract requirements prior to transmitting to the City's resident engineer. Each submittal shall have a submittal cover sheet that includes the submittal number, contractor's contact information, project title and public works number, transmittal date, description, contract references, and bid item number.

All original copies of submittals shall be provided to the City's resident engineer and scanned for electronic delivery to the City, EPA, and USACE. The City's resident engineer upon receiving the submittal with date stamp will log it into a tracking database. The City's resident engineer will attach the submittals to the weekly quality assurance report and forward to the remedial project manager, the agency construction oversight manager (USACE), and the City's project coordinator.

The City's resident engineer shall have 7 calendar days to review and respond back to NRC. Responses will be recorded into the tracking database by the City's resident engineer with electronic notification to NRC. Logs summarizing submittal activity will be provided to the project team on a weekly basis. An electronic and paper archive of all submittals will be retained by the City's QA representative.

5.2 PROGRESS MEETINGS

During construction, the City will hold weekly progress meetings led by the City's resident engineer and attended in-person by the remedial project manager and agency construction oversight manager (USACE); the City's project coordinator and resident engineer; and NRC's project manager and project supervisor. Typical meeting agenda includes review of schedule, review of submittals, safety and security, coordination with property owners, monitoring requirements, and requests for information.

5.3 INSPECTIONS, SAMPLING, AND VERIFICATION ACTIVITIES

NRC will conduct construction QC inspections, sampling and testing, and monitoring activities to ensure compliance with the terms and conditions of the contract. The City's resident engineer will monitor the construction QC activities to verify compliance with the contract requirements. The agency construction oversight manager and the City's QA representative will also conduct construction QA monitoring activities, as appropriate. Table 5-1 is adapted from the CQAP (Appendix B of the RADR; Integral 2012) and summarizes the required monitoring activities and frequencies for each of the construction elements. Table 5-1 will be used to assist in scheduling and tracking these activities. The City's resident engineer will update the table on an as needed basis per NRC's updates to the schedule, and include it in the weekly construction QA reports.

5.3.1 Confirmation Sampling

Extensive site characterization sampling was performed in 2012 to establish the boundaries of contaminated soil and to provide pre-excavation confirmation sampling results. The results of the pre-excavation confirmation samples are presented in Appendix G of the RADR (Integral 2012). With the following exceptions, no further post-excavation confirmation sampling is required. The exceptions are 1) portions of the planting strips, where the presence of underground utilities prevented the collection of pre-excavation samples, and 2) in the event that observations during excavation reveal potential contaminated soils at the base or sidewalls of the completed excavations. In these instances, confirmation sampling will be coordinated by the City's QA representative in accordance with Integral's pre-design QAPP (Appendix F of the RADR; Integral 2012).

5.4 CONSTRUCTION QA DOCUMENTATION AND REPORTING

Substantial construction documentation will be generated during removal action construction activities, as described in Section 4 of the CQAP (Appendix B of the RADR; Integral 2012). NRC will be responsible for construction QC. The City's resident engineer and QA representative will be responsible for construction QA (i.e., to verify that the required construction QC measures have been implemented). Key construction QA documentation (with relevant construction QC documentation) is discussed below.

Daily Construction Quality Control Report

NRC will prepare daily construction QC reports, as described in the technical specifications (Appendix A of the RADR; Integral 2012) and NRC's CQCP (Section 4.12 of this RAWP), and submit them to the City's resident engineer. The daily QC reports will summarize the work performed by NRC and subcontractors, the equipment used, and the results of any QC inspections, tests, or other monitoring activities. The reports will also document any

noncompliant conditions, communication of such conditions to the City's resident engineer, and corrective actions taken to attain compliance. The City's resident engineer will review the daily reports to verify compliance with applicable QC requirements and will notify the City and EPA upon discovery of any substantive nonconformance issues or deviations from the approved project plans. The daily QC reports will be compiled and attached to each weekly quality assurance report. In addition, all daily QC reports will be included within an appendix to the removal action completion report.

Weekly Quality Assurance Report

The City's resident engineer and QA representative will prepare weekly construction QA reports and submit them to the remedial project manager, agency construction oversight manager (USACE), and the City's project coordinator. The weekly quality assurance reports will summarize the construction events that occurred during the previous week, as well as any delays and their causes. The report will describe the results of QA inspections, testing, and monitoring activities, and the effectiveness of NRC's QC activities.

Existing Conditions Documentation

Prior to performing removal activities within a specific yard, NRC, in coordination with the City's resident engineer, will document existing conditions within that yard. Documentation may include, but not be limited to, digital photography, video, field notes and sketches. NRC will submit the existing conditions documentation to the resident engineer. This documentation shall serve as a post-restoration tool, to demonstrate that removal and restoration activities have returned the site to pre-removal conditions without damage to adjacent structures or property.

Topographic Survey Reporting

NRC will complete daily progress surveys and acceptance surveys in accordance with its approved surveying plan (Section 4.6 of this RAWP). NRC will submit the reports to the City's resident engineer. The City's resident engineer will distribute the surveys to the project team. The City's resident engineer will review NRC's daily progress and acceptance surveys, including submitted drawings, field notes, and quantity computations to verify compliance with the construction plans and specifications. In addition to review of survey submittals, post-excavation confirmation surveying will be subject to instantaneous review during survey data collection. The City's resident engineer and agency construction oversight manager (USACE) will observe the surveyor's instrument readings in real time to verify that target excavation elevations have been met, prior to backfilling.

Import Material Characterization Reports

NRC will submit a list of import material sources, along with available physical and chemical characterization data, to the City for approval no later than 14 calendar days prior to the

commencement of construction. If chemical or physical testing of the materials is required, sample collection and testing will be coordinated by the City's QA representative in accordance with Integral's pre-design QAPP (Appendix F of the RADR; Integral 2012). The required chemical and physical characteristics of import materials are specified in the technical specifications (Appendix A of the RADR; Integral 2012).

Waste Profiles and Manifests

NRC will prepare and submit all transportation-related shipping documents including waste characterization reports and waste manifests. These must comply with the EPA's Off-Site Disposal Rule. The pre-excavation confirmation sampling results summarized in Appendix G of the RADR (Integral 2012) will be used for chemical characterization of the waste materials when possible. If additional physical or chemical characterization testing is required by the disposal facility, it will be coordinated by the City's QA representative in accordance with Integral's pre-confirmation QAPP (Appendix F of the RADR; Integral 2012). Waste profiles will be submitted to the disposal facility no later than 7 calendar days prior to the proposed material shipment.

5.5 FIELD CHANGE DOCUMENTATION

The City's resident engineer will meet weekly with the City's project coordinator, and QA representative; the agency construction oversight manager (USACE), and remedial project manager; and, NRC's project manager to review the weekly construction QA report and to keep EPA informed of continuing events as the remediation work proceeds. Any work not in accordance with the EPA-approved removal design drawings, specifications, and plan documents will be brought to the attention of EPA. In some cases, the remedy will involve NRC correcting the work to comply with the construction drawings and technical specifications (Appendix A of the RADR; Integral 2012). In other cases, changes to the design may be needed.

In the event that a change or changed condition is encountered by NRC, or if construction QA inspections reveal out-of-specification conditions requiring a change in the design or construction process, the City's resident engineer and project coordinator will review the condition to assess what revision may be required to maintain consistency with the intent of the RADR (Integral 2012). A field change memo (Figure 5-1) will be issued by the City's resident engineer to NRC after 1) consulting with the project coordinator to recommend the needed revision(s) to the work/contract, and 2) obtaining the agency construction oversight manager and remedial project manager approvals.

Changes affecting the removal action must be approved by EPA before being implemented. EPA will review these recommended changes to ensure they are consistent with cleanup objectives and are protective of human health and the environment. In addition, EPA review will ensure that the change conforms to performance standards, ARARs, and requirements of the SOW (USEPA 2011). In this capacity, EPA will review and approve the design documents

and other contractor submittals, to ensure that the construction QC program is consistent with the removal design objectives.

Information on field change memos and their status will be provided in the weekly construction QA report.

5.6 POST CONSTRUCTION DOCUMENTATION

Record Drawings, Manuals, and Certificates

NRC is required to submit record drawings and supporting documents for various elements of the construction, including pre-construction surveys, excavation surveys, imported soil characterization reports, modifications to this RAWP, and restored site surveys in accordance with Technical Specifications Section 01 71 23 – Field Engineering (Appendix A of the RADR; Integral 2012).

Pre-Final Punch List

Pursuant to Technical Specifications Section 01 45 00 – Quality Control (Appendix A of the RADR; Integral 2012), near the completion of all work or any increment thereof established by a completion time set forth in the specifications, NRC's QC representative, the City's resident engineer, project coordinator and EPA's remedial project manager and agency construction oversight manager, and the homeowner/tenants shall conduct an inspection of the work and develop a punch list of items that do not conform to the contract documents. This pre-final punch list shall be included in the construction QC documentation prepared by NRC, and shall include the estimated date by which the deficiencies will be corrected. Once this is accomplished, NRC shall notify the City that the site is ready for a final inspection by the above noted parties.

Following the final inspection, the City's resident engineer, in coordination with NRC, will prepare a final inspection report documenting the satisfactory completion of the pre-final punch list items.

6 REFERENCES

City of Seattle. 2009. Directors' Rules for Seattle Municipal Code, Chapters 22.800—22.808, Stormwater Code Volume 2, Construction Stormwater Control Technical Requirements Manual, Directors' Rule 2009-004 (SPU), 16-2009 (DPD). Prepared by City of Seattle, Seattle Public Utilities, Department of Planning and Development, Seattle, WA. November.

City of Seattle. 2011. Standard Specifications for Road, Bridge and Municipal Construction. Prepared by City of Seattle, Seattle Public Utilities, Department of Planning and Development, Seattle, WA. January.

HSPA and Integral. 2012. Community Involvement Plan, Residential Yard and City Street Cleanup, Lower Duwamish Waterway Superfund Site, Terminal 117 Early Action Area. Prepared for the City of Seattle. Harris & Smith Public Affairs, Seattle, WA; and Integral Consulting Inc., Seattle, WA. April 24.

Integral. 2012. Removal Action Design Report, Residential Yards Area, Lower Duwamish Waterway Superfund Site, Terminal 117 Early Action Area. Prepared for the City of Seattle. Integral Consulting Inc., Seattle, WA. November 30.

USEPA. 2010. LDW Superfund Site, Seattle Washington. Action Memorandum—T-117 Early Action Area. U.S. Environmental Protection Agency Region 10, Seattle, WA. September 30.

USEPA. 2011. Administrative Settlement Agreement and Order on Consent for Removal Action Implementation (Settlement Agreement and Statement of Work [SOW]). U.S. Environmental Protection Agency Region 10, Seattle, WA. June 9.

Windward, Integral, AECOM, Crete, and DOF. 2010. Lower Duwamish Waterway Superfund Site, T-117 Early Action Area, Revised Engineering Evaluation/Cost Analysis. Prepared for the Port of Seattle and the City of Seattle. Windward Environmental LLC, Seattle, WA; Integral Consulting Inc., Seattle, WA; AECOM, Seattle, WA; Crete Consulting, Inc., Seattle, WA; and Dalton, Olmsted & Fuglevand, Inc., Seattle, WA. June 3.

FIGURES



S:\SiteA0006 Lower-Duamish Various\A0006 15H T117\Working MXDs\60pcDesign\Fig2 Excavation Yards 10292012.mxd 10/29/2012 2:27:45 PM



Figure 1-2.
Soil Excavation Boundaries for Residential Yards
Lower Duwamish Superfund Site - Terminal 117 Early Action Area

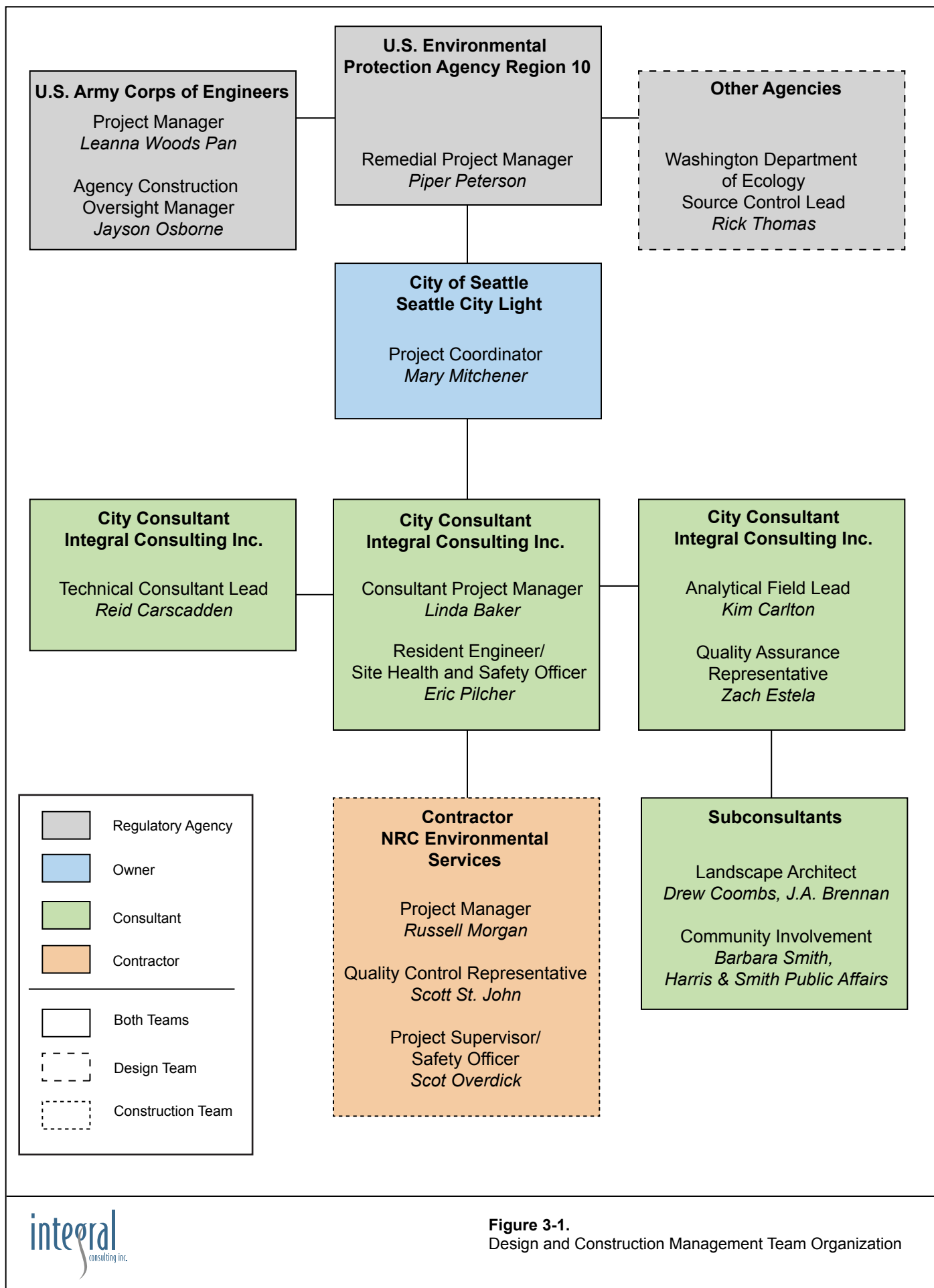


Figure 3-1.
Design and Construction Management Team Organization

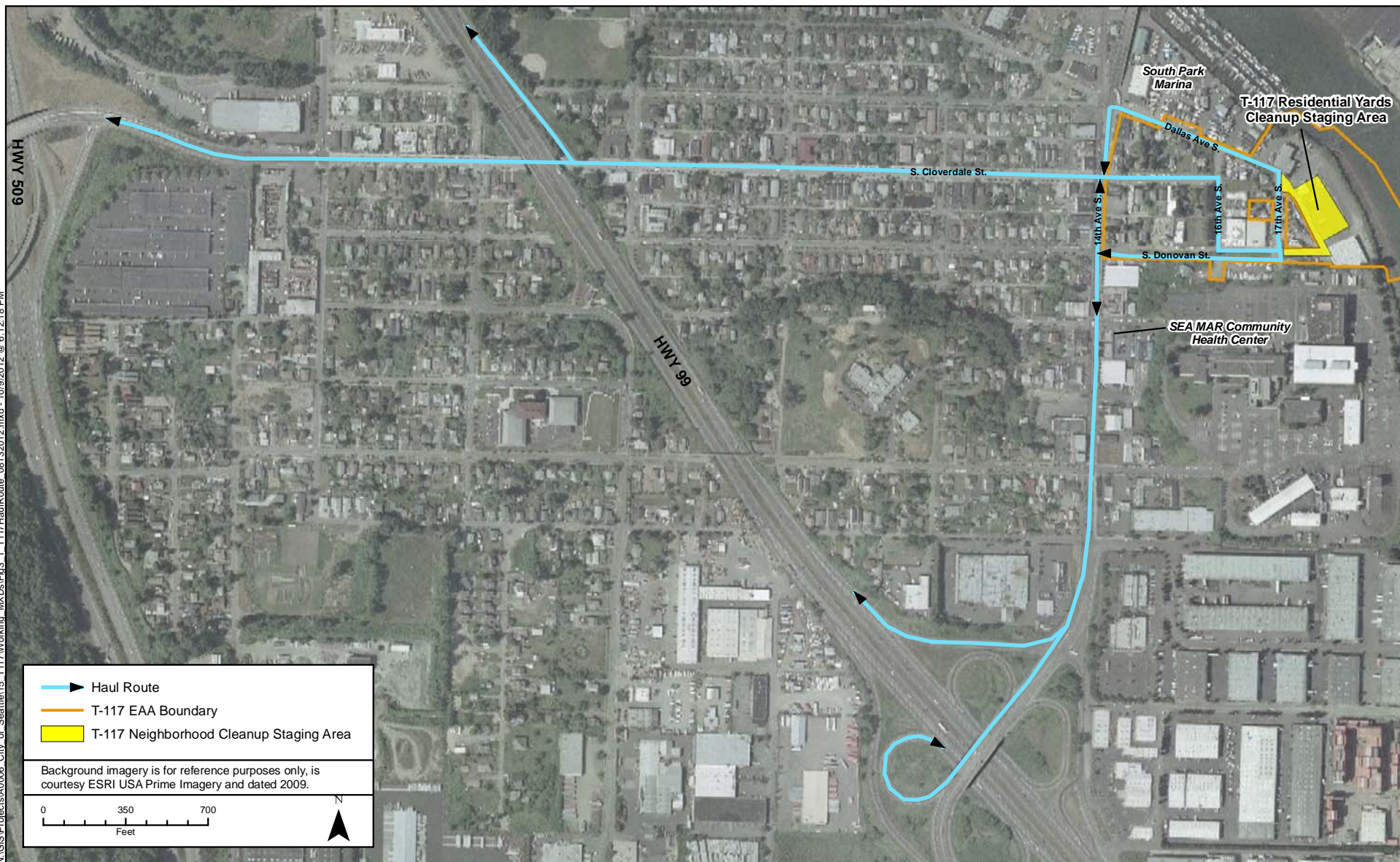


Figure 4-1.
Haul Route From T-117 to Highway
Lower Duwamish Waterway - Terminal 117 Early Action Area

Field Change Memo # _____

Contract Name:

Contractor:

Subject:

Date/Time:

PW:

Method of Notification: E-mailed to: _____

Hand delivered to: _____

PLEASE REPLY TO:

Resident Engineer:

Contractor's Reply:

Contractor's Rep Acknowledgement:

Date/Time:

TABLES

Table 4-1. Excavation Depths, Elevations, and Quantities

Affected Property, Ownership, and Decision Unit	Minimum Removal Depth (ft bgs) ^a	Lowest DU Elevation (ft NAVD88)	Target Removal Elevation (ft NAVD88)	Removal Area (sf)	Removal Volume (cy) ^b
8523 Dallas Avenue S. (Security National Mortgage)					
DU01	1.0	17.9	16.9	1,878	121.4
1410 S. Cloverdale Street (McKnight)					
DU03	2.0	18.7	16.7	2,829	261.3
1421 S. Cloverdale Street (Hill)					
DU36a	1.5	20.1	18.6	233	17.6
DU36b	No Removal	-	-	-	-
1425 S. Cloverdale Street (Collins/Johnson)					
DU35	2.0	19.9	17.9	1,747	132.9
DU35a	2.5	19.9	17.4	770	73.7
1440 S. Cloverdale Street (Collins/Malagon)					
DU14	1.0	19.5	18.5	3,198	253.2
1445 S. Cloverdale Street (Barnett)					
DU32a	0.5 ^c	20.1	19.6	749	31.4
DU33a	1.0	20.6	19.6	546	25.4
DU33b	No Removal	-	-	-	-
1418 S. Donovan Street (Carroll)					
DU25	2.0	19.6	17.6	864	93.2
DU25a	No Removal	-	-	-	-
DU25b	No Removal	-	-	-	-
1430 S. Donovan Street (Colson)					
DU 23	0.5 ^c	TBD	TBD	TBD	TBD
Yard Subtotal				12,814	1,010.2
S. Cloverdale Street Planting Strip, North (Seattle DOT)					
PS North A	1.0	19.1	18.1	947	48.5
PS North B	2.0	19.8	17.8	359	35.5
PS North C	1.0	20.2	19.2	260	15.2
S. Cloverdale Street Planting Strip, South (Seattle DOT)					
PS South A	2.0 ^d	19.2	17.2	305	29.7
PS South B	2.0 ^d	19.5	17.5	348	34.0
PS South C	2.0 ^d	19.9	17.9	642	63.1
Planting Strip Subtotal				2,861	226.0
Southern Alleyway (Seattle DOT)					
14a, 14b, 14c	2.5	20.7	18.2	1,910	231.3
15a, 15b, 15c	1.0	20.5	19.5	707	36.6
16a, 16b, 16c	1.0	20.1	19.1	733	42.9
17a, 17b	1.0	19.7	18.7	1,419	80.2
21a, 21b	3.0	20.5	17.5	839	112.1
Northern Alleyway (Seattle DOT)					
18b	No Removal	-	-	-	-
19b	No Removal	-	-	-	-
20b	No Removal	-	-	-	-
Alleyway Subtotal				5,608	503.1
Project Total				21,283	1,739.3

Notes:

^a Minimum removal depth defined by pre-design confirmational sampling concentrations below the removal action level of 1.0 mg/kg. Refer to the pre-excavation confirmation sampling results for the Residential Yards study area (Appendix G of the removal action design report; Integral 2012).

^b Based on level excavation at the target elevation across the entire decision unit.

^c 0.5 ft held as minimum excavation depth. Pre-design confirmation sampling indicated non-exceedence below 0.2 ft.

^d Removal depth was not pre-confirmed due to presence of shallow utility line. Additional excavation may be necessary based on post-excavation confirmation sampling results.

TBD = To be determined, pending completion of pre-construction survey.

Table 4-2. Emissions Control Measures

Activity	Control Measures
Soil Excavation, Handling, Loading, Disposal; Backfilling and Grading; and Other Site Earthwork	<ol style="list-style-type: none"> 1. Apply water to work and traffic areas, as necessary, to minimize fugitive dust emissions. 2. Cover exposed soil and temporary stockpiles, as necessary and appropriate, to minimize wind or stormwater erosion. 3. Move and load soil for offsite disposal in a manner that limits free-fall of material and is least likely to generate dust emissions; cover and tarp loads prior to exiting the site. Any spilled materials will be immediately cleaned up to the satisfaction of the resident engineer. 4. Limit or halt dust-generating work during very windy conditions. 5. Limit the size of open excavations or the duration an excavation is left open in areas where odor generating constituents are found.
Movement of Equipment	<ol style="list-style-type: none"> 1. Water traffic areas, as required, to minimize dust emissions. 2. Designate equipment traffic patterns to minimize travel distance and vehicular dust emissions. 3. Limit vehicle speed to minimize dust emissions.
Equipment Decontamination	<ol style="list-style-type: none"> 1. Cover traffic areas to and from the decontamination work pad(s) with clean gravel, as appropriate. 2. Clean equipment with hand tools and a pressure washer to remove soil and contamination, as necessary. Excavation equipment will be decontaminated prior to handling clean backfill materials.
Wind Erosion	<ol style="list-style-type: none"> 1. Apply water, as necessary, to minimize dust emissions. 2. Cover exposed materials with properly weighted polyethylene sheeting.
Demolition, Debris Size Reduction, and Debris Loading	<ol style="list-style-type: none"> 1. Demolish, cut, and break up debris in a controlled manner that minimizes dust emissions. 2. Collect loose dirt and debris from surfaces prior to and following demolition. 3. When required, dampen surfaces with water prior to and as required during demolition, debris size reduction, and loading activities. 4. Move and load debris for offsite disposal in a manner that limits free-fall of material and is least likely to generate dust emissions; cover and tarp loads prior to exiting the site as appropriate. 5. Limit or halt dust-generating work during very windy conditions. 6. Cover temporary debris and material stockpiles and work areas, if necessary and appropriate, to minimize wind and/or stormwater erosion.

Table 4-3. Proposed Disposal Facilities

Media/Waste Stream (estimated quantity)	Facility	Disposal Description	Permit/Authorization
NON-TSCA Soil and/or petroleum contaminated soil. (~1,700 cubic yards, 2,800 tons)	Roosevelt Regional Landfill 500 Roosevelt Grade Road Roosevelt, WA 99356 (509) 384-5641	RCRA Subtitle D Landfill	CERCLA Approved Facility
TSCA Soil (none anticipated)	Chemical Waste Management of the NW 17629 Cedar Springs Lane Arlington, OR 97812	RCRA Subtitle C Landfill/TSCA Permitted Landfill	US EPA Part B Permit # ORD 089 452 353
Clean concrete and asphalt for recycle (200 tons)	Renton Concrete Recyclers 500 Monster Road S.W. Renton, WA (206) 772-2278	Concrete and Asphalt for Recycling	WA State Department of Ecology / Sand and Gravel Permit
Non-contaminated vegetation (50 tons)	Pacific Topsoils 6000 S 129th St Tukwila, WA 98178	Composting	Operating Permit
	Lloyd Enterprises Inc 34667 Pacific Hwy South Federal Way, WA 98003 (253) 874-6692	Composting	Operating Permit
Clean recoverable metal (20 tons)	Seattle Iron & Metals 601 South Myrtle Street Seattle, WA 98108 (206) 682-0040	Metal for recycling	Operating Permit
	Schnitzer Steel 1902 Marine View Drive Tacoma, WA 98422 (253) 572-4000	Metal for recycling	Operating Permit
Wastewater generated from construction storm water, dewatering and decontamination (2000 gallons)	Petroleum Reclaiming Services Inc (PRS Group) 3003 Taylor Way Tacoma, WA 98421 (253) 383-4175	Wastewater disposal	RCRA ID # 980511729
	Emerald Services Inc Seattle, WA 98134 and Seattle, WA 98108 (206) 832-3000	Wastewater disposal	RCRA ID # WAD058367152 and WAD058364647
	Marine Vacuum Services, Inc 1516 South Graham Street Seattle, WA 98108 (206) 762-0240	Wastewater disposal	RCRA ID # WA980974521
	Burlington Environmental (PSC) 77th Avenue S. Kent, WA 98032 (253) 395-0377	Wastewater disposal	RCRA ID # WAD990974521

Table 5-1. Summary of Construction Monitoring and Testing Requirements

Technical Specifications Reference	Monitoring/Testing Requirement	Responsible Party	Frequency
Section 01 35 30	Safety and Health Requirements		
	1. No visible dust	Contractor/City	Continuous during construction
	2. Engine idling not to exceed 2 minutes; exhaust monitoring if requested by City or EPA	Contractor	Continuous during construction
	3. No smoking in work areas or on private property	Contractor/City	Continuous during construction
	4. Noise levels not to exceed 80 decibels	Contractor	During initial equipment operation until verified
Section 01 45 00	Quality Control		
	1. Baseline site conditions photographic survey	Contractor	Prior to beginning construction activities at each property ^a
	2. Chemical and physical test certificates for imported materials characterization	Contractor/Source Supplier	Prior to delivery to the site
	3. Imported materials chemical characterization sampling and testing	City	Prior to delivery to the site
Section 01 57 50	Temporary Environmental Pollution Control		
	1. Vehicle decontamination	Contractor	Prior to handling clean import material or removal from site
	2. Visual monitoring of wastewater containment	Contractor	Continuous during construction
	3. Visual monitoring of best management practices	Contractor/City	Daily
	4. Chemical testing of wastewater and stormwater	Contractor	In accordance with disposal facility requirements
Section 01 71 23	Field Engineering		
	1. Pre-construction baseline topographic survey	City	Prior to construction ^a
	2. Progress surveys	Contractor/Surveyor	Within 12 hours of completing daily excavation or backfilling activities
	3. Final excavation acceptance survey ^b	Contractor/Surveyor	After completing excavation at each property
	4. Final restoration survey	Contractor/Surveyor	After completing backfill, compaction, and grading at each property
	5. Record document survey	Contractor/Surveyor	After completion of all construction activities
Section 01 74 19	Construction Waste Management and Disposal		
	1. Waste characterization	Contractor	Prior to disposal, as required by landfill
	2. Visual inspection for spillage	Contractor/City	Prior to transport of materials from the site
Section 31 00 00	Clearing, Excavation, and Backfill		
	1. Compaction testing of backfill	Contractor	During backfilling, as necessary

Notes:

^a A pre-construction baseline topographic survey was prepared by the City prior to design. However, the contractor is responsible for documenting existing site conditions prior to construction.

^b Inspection/concurrence of excavations by the City and EPA is required prior to backfill.